

A Plant Species Inventory with Emphasis on Rare Species Fort Rodd Hill / Fisgard Lighthouse National Historic Sites

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Executive Summary

The focus of this study was to survey the properties of Fort Rodd Hill / Fisgard Lighthouse National Historic Sites for rare plant species listed as "RED" or "BLUE" by the BC Conservation Data Centre (CDC), or as vulnerable, threatened, or endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

Secondly, a complete inventory of vascular plant species was to be compiled, building and

enlarging on a checklist provided by Matt Fairbarns (Aruncus Consulting, 2002).

Occurrences of seven rare species were found in a total of 12 sites. Two of these plant species are listed by COSEWIC as "endangered" and "vulnerable" respectively and all seven species are listed by CDC as follows:

Deltoid balsamroot (*Balsamorhiza deltoidea*), endangered (COSEWIC), red-listed (CDC) Macoun's meadow-foam (*Limnanthes macounii*), vulnerable (COSEWIC), blue-listed (CDC) Winged water star-wort (*Callitriche marginata*), red-listed (CDC) Carolina meadow-foxtail (*Alopecurus carolinianus*), red-listed (CDC) Red-stem spring beauty (*Claytonia rubra ssp. depressa*), red-listed (CDC) Poverty clover (*Trifolium depauperatum*), blue-listed (CDC) Nuttall's quillwort (*Isoetes nuttallii*), blue-listed (CDC)

Most at risk of these plants is deltoid basamroot due to ecosystem degradation. Removal of introduced shrubs, monitoring of organisms detrimental to the plants, and experimental fencing are recommended in an attempt to save these endangered plants. The smaller one of two occurrences of Macoun's meadowfoam is also believed to be at risk of being lost. Restorative management in this case would have to involve removal of introduced perennial grasses.

The general species inventory yielded 336 plant species, a large number for a 54 ha area. An extremely large portion, 44% of these species, are introduced. The large number of alien plants is a reflection of the many human uses and activities this area has seen in the last 140 years.

Table of Contents

Executive Summary	page 1
Table of Contents	2
Introduction	3
Methods	3
Results and Discussion	
1. Rare Species	4
Balsamorhiza deltoidea / deltoid balsamroot	4
Fisgard Lighthouse National Historic Site	5
Limnanthes macounii / Macoun's meadowfoam	6
carolinianus / Carolina meadow-foxtail	6
Isoetes nuttallii / Nuttall's quillwort	7
Trifolium depauperatum / poverty clover	7
Claytonia rubra ssp. depressa / red-stem spring beauty	8
Vascular Plant List Table 2 Vascular Plant Species of Fort Rodd Hill / Fisgard	8
Lighthouse National Historic Site	10
References	18
Appendices	p 19

- Conservation Data Centre Field Survey Forms for 12 rare plant occurrences
- Figure 1 Location of Rare Plants at Fort Rodd Hill / Fisgard Lighthouse National Historic Site
- Plate 1 Limnanthes macounii / Isoetes nuttallii / Trifolium depauperatum
- Plate 2 Balsamorhiza deltoidea / Claytonia rubra ssp. depressa / Callitriche marginata / Alopecurus carolinianus

Introduction

The present inventory has been commissioned as a follow-up to a recent vegetation mapping project for the area of Fort Rodd Hill / Fisgard Lighthouse National Historic Sites (Aruncus Consulting, 2002). This mapping was prepared for park management purposes, including invasive species control. However, before restorative measures can safely be applied it is imperative to know the exact location, distribution, and key habitat conditions of rare plant populations. These were known only for two occurrences of Macoun's meadowfoam, but old collection records indicated that another very rare species, deltoid balsamroot, had once existed in the area. If this endangered species was still present, and if yes, in which location, was not known. Further, a deliberate effort to locate rare plants in the remainder of the diverse natural area controlled by Parks Canada was never carried out.

In the past the study area was primarily managed for its historic significance. There is now heightened awareness and concern about natural communities and rare species as well, brought about, among others, locally by the activity of the Garry Oak Ecosystem Recovery Team and nationally by the approaching federal Species At-Risk Act.

For a thorough description of the human and natural history of the study area the reader is referred to the above-mentioned study (Aruncus Consulting, 2002).

Methods

In preparation for field work on-site, map and air photo coverage for the study area, as well as the vegetation mapping and descriptions by Aruncus Consulting were reviewed. The 146 rare plants listed for the Duncan Forest District in the "blue" and "red" lists of the BC Conservation Data Centre were also reviewed for their potential to occur in the local area and habitats. Dr. Nancy Turner who had known the author of the 1966 deltoid balsamroot collection was contacted and subsequently helped to locate the exact collection locality.

Consideration of the red/blue lists indicated that other potential occurrences would be primarily of early-season species and this determined the timing of field work between April and end of May. After reviewing the habitats it was determined that there was also the potential for two later-season rare plants, *Piperia candida* and *Agrostis pallens*. Additional field time was devoted to these in July.

In the field every polygon mapped by Aruncus Consulting was visited. The amount of time devoted to the polygon was determined by its relative size and by the presence of habitat suitable for those species extracted from the CDC lists.

Once rare plant species were located, GPS readings were taken, the size and configuration of the population, associated species and habitat variables such as slope, aspect, soil and moisture conditions were recorded as required in the CDC "Field Survey Form (Plants)". Photographs were taken to document the occurrence.

For the general checklist of plant species names were noted while traversing the polygons and examining specific rare plant sites. Most identifications could be made in the field. Collections were not needed for identification of any of the rare species. A few collections were made, often only of parts of a plant, to correctly identify some of the many introduced species.

The Illustrated Flora of British Columbia (Douglas et al, 1998 to 2002) was used for most identifications and is followed for nomenclature.

Results and Discussion

1. Rare Species

The main focus of this study was to inventory plant species which are currently listed, either by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), or by the BC Conservation Data Centre (CDC).

Table 1 summarizes the findings on these rare species. Twelve rare species occurrences of seven different species were found in eight different locations within the National Historic Sites properties (compare map, Figure 1). Of these locations one supports four species and another one two species, while the remaining six have single species.

Of the seven species, four are red-listed and three blue-listed by CDC, with one listed as "endangered" and one as "vulnerable" by COSEWIC.

CDC Field Survey Forms have been filled out for each of the rare species occurrences and are included in the appendix. They contain details about the encountered populations, the site parameters, and the associated species. The following discussion of each species will therefore need to enlarge only on the key characteristics of the site that enables the population, on the risk factors that may exist for the survival of the population, and on recommendations for management, where applicable.

Balsamorhiza deltoidea / deltoid balsamroot

This is clearly a population in decline. The species was on record at the BC Conservation Data Centre as having been collected and last observed in April, 1966. When the herbarium specimen was procured the plants were flowering. At present there are only four non-flowering plants.

In recent decades no record was obtained that would have shed some light on the health, and indeed the existence and locality, of the population.

The author is indebted to Dr. Nancy Turner who was shown this population by the original collector and who helped locate the remaining plants in the field.

There is no clear indication what the main reason for the decline of the plants is. However, it could be a combination of the following (in decreasing order of likelihood):

- 1) Herbivory, by invertebrates, possibly also vertebrates
- 2) Competition by non-native vegetation, in particular grasses
- 3) Increased shading by Garry oaks and Douglas-firs

Herbivory by invertebrates (slugs, sowbugs, cutworms and earwigs) was observed by the author on balsamroot plants that he attempted to re-establish in a similar plant community. It occurred in the early bud stages before the leaves emerged in the spring. Early-season damage was also evident on most of the leaves in the present population.

Introduced grasses are among the dominants surrounding the remaining four plants. Besides their physical competition for space, these plants may provide a modified, foreign habitat in which introduced invertebrates find their preferred conditions. Other potential competitors, including leather-leaf daphne and Scotch broom, are at present not abundant enough in close vicinity of the *Balsamorhiza* to have a detrimental influence (in fact, the closest broom plants are kept short by deer browsing). However, they may well be a threat in the future and should be removed manually from the vicinity.

Table 1 Summary of Rare Plant Occurrences At Fort Rodd Hill / Fisgard Lighthouse National Historic Sites

Species name / site #	BC CDC	COSEWIC	Number of	Special habitat	Main risk to population (if any)
(site location on Fig.1)	status	status	plants		
Balsamorhiza deltoidea (deltoid balsamroot), site10	RED G5 S1	endangered	4	Garry oak woodland	Ecosystem degradation through introduced plants and animals?
Callitriche marginata (winged water-starwort), site 8/9	RED G4 S1	1	(patch of 200 cm^2)	Stagnant ephemeral pool	Human modification of habitat
Alopecurus carolinianus (Carolina meadow-foxtail), site 8/9	RED G5 S2	1	48	Stagnant ephemeral pool	"
Claytonia rubra ssp. depressa (red-stem spring beauty), site 5	RED G5T? S2	1	14	Shoreline rock walls	
Claytonia rubra ssp. depressa (red-stem spring beauty), site 6	22	1	120	"	1
Linnanthes macounii (Macoun's meadow-foam), site 3	BLUE G3 S3	vulnerable	135	Shoreline vernal pool and seepage site	Competition by introduced grasses
Linnanthes macounii (Macoun's meadow-foam), site 7	22	vulnerable	25	"	n
Isotes nuttallii (Nuttall's quillwort), site 1	BLUE G4? S3	1	15	Shoreline vernal pool hollow	Possible risk through vigorous growth of introduced grasses
Isoetes nuttallii (Nuttall's quillwort), site 12	22	1	800-1000	Inland vernal pool, possibly an artificial site	Possible expansion of Agrostis stolonifera into Isoetes habitat
Trifolium depauperatum (poverty clover), site 2	BLUE G5 S2	-	110	Shallow soils supporting only short turf of annuals	Invasion by taller plants, mainly introduced species.
Trifolium depauperatum (poverty clover), site 4	>>	-	09	"	n
Trifolium depauperatum (poverty clover), site 11	"	1	1	23	93

The growing site is only slightly more shaded than other local sites from which *Balsamorhiza* deltoidea is known.

It is recommended to experimentally surround all four plants or the three plants which are separated by about 1 m from the fourth plant by a small-mesh wire fence to observe if vertebrate grazing is involved (there is no evidence of this on the later-season foliage). A similar measure is recommended in the draft restoration plan for a balsamroot population on Mill Hill Regional Park (CRD Parks, 2002). In this case deer browsing has been documented (Louise Blight, pers. comm.). At the same time, observations should be made at leaf emergence time (early to mid-March) by an observer with invertebrate knowledge, with the goal of identifying the organisms which damage or consume the leaves at that stage. As an alternative or later measure, limbs of those Douglas-firs that shade the growing site during part of the day could be carefully thinned out.

Limnanthes macounii / Macoun's meadow-foam

Key characteristics for *Limnanthes* habitat appear to be an open, exposed site near the shoreline, slight to strong early-season seepage (in some cases vernal pool conditions), and nutrient-rich sites. The larger of the two occurrences (Yew Point) is highly enriched with organic nutrients by virtue of seabird droppings, seabird food scraps, and river otter feces. The population in this site appeared extremely healthy, flowered and fruited profusely, and consisted of much larger plants than the small population below Belmont Battery. In both sites eutrophication is not only responsible for vigorous *Limnanthes* growth, but also for very lush growth of non-native grasses, especially *Lolium perenne* and *Hordeum murinum*, which tend to shade out and suppress the *Limnanthes* plants.

Limnanthes macounii is a winter annual which makes much of its growth when its habitat is free of competition between early winter and early spring. It is most successful where no perennial species compete for space during this winter growing period. Site 7 is slightly drier habitat than site 3 and the grass cover, including the perennial Lolium perenne appears to close in on the plants earlier in the season, making it a more marginal site for Limnanthes where the population is more in danger of becoming lost.

Any recommendation how to perpetuate a *Limnanthes* site would therefore have to focus on the prevention of competition by perennial grasses, a task not easily accomplished in the long term, although selective weeding of perennial grasses has been tried elsewhere (O. and A. Ceska, pers. comm.).

Monitoring of the populations, especially that on site 7, is recommended.

Callitriche marginata / winged water star-wort and Alopecurus carolinianus / Carolina meadow-foxtail

These two species occupy identical habitats in a single site and may therefore be discussed together.

Key characteristics of this vernal pool habitat are wet conditions that persist through winter and spring and moist conditions to the beginning of June, after which the habitat dries out completely. The two species depend on the open mud areas which stay free of perennial vegetation and only support small annuals during the gradual drying-out period. The two species have slightly different timing, with *Callitriche* completing its growth cycle earlier and *Alopecurus* completing it later.

Barring construction that would alter the configuration of the habitat or its water supply, or re-routing of visitor traffic into this area, there are no apparent risks to these small populations, other than natural variations in moisture depending on the annual weather cycle which affect all annual plant populations.

Scotch broom and leather-leaf daphne will not survive in this habitat due to the wetness. However, they should still be removed from the vicinity to prevent additional shading from the sides of the vernal pool area. It should be monitored if the introduced grass *Agrostis stolonifera* advances toward the *Callitriche/Alopecurus* microhabitat.

Isoetes nuttallii / Nuttall's quillwort

Site 1: This is a very small population persisting in an equally small vernal pool, more appropriately described as a small muddy hollow on the same Yew Point shoreline bluffs that support the *Limnanthes* population (site3). The same risks apply to this habitat and its population as described for *Limnanthes macounii*. The habitat itself is too wet for the perennial plants to compete directly with *Isoetes*. However, the long foliage of lush grasses hangs over the small vernal hollow and interfers with *Isoetes* by shading. By comparison with other occurrences of Isoetes nuttallii some of which hold tens of thousands of plants, the significance of this population is low. Remedial action to prevent the possible loss of this population appears not warranted.

Site 12: The *Isoetes* population in this area occurs in a forest opening of about 25 m diameter which is surrounded by young (up to 10 m tall) Douglas-firs. The site makes a rather disturbed impression and there are only very few native species that indicate what the natural plant community may have been. From the lack of taller plants in the opening and the completely parched conditions in summer it is apparent that the soil must be only a shallow layer over bedrock. Why it is only Douglas-firs that surround the opening and not Garry oaks could not be determined.

Whatever its history may have been, the present *Isoetes* population is very vigorous. Increased openness after the removal of the original tree growth may have increased the population. *Isoetes* occurs only in the wettest microhabitats within the opening and does not at present appear to be affected by competion from the surrounding introduced grasses or Scotch broom. However, the further development of the *Agrostis stolonifera* cover should be monitored and broom should be removed.

Trifolium depauperatum / poverty clover

There are two locations where this species was found, both close to tidewater. Only one plant was seen on site 11 in the extreme SW corner of the property and this occurrence need not be separately discussed as the habitat and species combination are very similar to that where the majority of plants grow.

The Yew Point location has two occurrences (sites 2 and 4) which merge into each other along an animal (deer, otter?) trail.

Key features of all three *Trifolium depauperatum* occurrences are that the sites are very open and exposed and that the plants appear to thrive only in the shortest of turf communities. Other species that form this community are almost exclusively small annuals. Additionally, the sites have a slight spring seepage influence in common. This combination of community and site factors is rare and occurs mainly where very shallow soils over smooth bedrock surfaces create winter-wet / summer dry conditions that prevent perennial plants.

Dominant and potentially competing plants are fool's onion (*Triteleia hyacinthina*) in a non-flowering, vegetative stage and often other small species of clover. All these plants are tightly cropped by deer and by introduced eastern cottontail rabbits. It is quite possible that this grazing contributes itself to the habitat availability for *Trifolium depauperatum*, creating as it does the very short turf community which seems to be obligatory for the occurrence of these plants .

The main risk factor for this clover is taller and perennial vegetation. Scotch broom should be removed from the vicinity of sites 2, 4 and 11. Beyond this there are no practical recommendations how to further maintain or enhance the above-described conditions.

Claytonia rubra ssp. depressa / red-stem spring beauty

The species (*C. rubra s.l.*) is described as occupying a variety of habitats (Douglas et al., 1999, p.112). However, the red-listed subspecies in the National Historic Sites property is only found on the sheltered side of steep shoreline rock outcrops where the plants are anchored in cracks and/or moss patches. Another factor appears to be slight eutrophication by seaspray and gull droppings.

The plants and their habitat are not at risk from either human interference or from competing vegetation.

2. Vascular Plant List

Table 2 shows all vascular plants encountered on the National Historic Site properties. The first priority in this general species inventory was to produce a complete checklist of native species. Non-native, naturalized species were also recorded. But no great importance was placed on detecting every last exotic species deliberately planted in formerly landscaped areas. Instead, those species that appeared to have survived the last decades without care on their own and that may have a potential of persisting were included in the inventory. Abundance ratings were applied to the native species as well as the latter. But it should be kept in mind that these are less meaningful for those introduced species that were at one time deliberately planted. Table 2 was prepared in a compatible format to that of Fairbarns (Aruncus Consulting, 2002) and species listed by Fairbarns were incorporated into the present list, whether confirmed in the present survey or not. Nomenclature follows the Illustrated Flora of British Columbia (Douglas et al., 1998-2002).

Threehundred and thirty-six (336) taxa of vascular plants were recorded in the National Historic Sites properties. This is a large number, taking in account the size of only 54 hectares and even the relative diversity of available habitats.

At the same time the number of 147 introduced taxa, 44% of the vascular flora, is extremely high. This compares with 677 introduced species province-wide and a provincial flora of 2,993 taxa (Douglas et al, 2002, p.1), a ratio of only 23%. This very large component of introduced plants must be interpreted as a result of a relatively long non-native human history, of the many different human uses the properties experienced (e.g. military, lighthouse, residential, garden, park), and of the multitude of different associated disturbances of the vegetation and the soils. The high total number of taxa is interpreted as

the result of a remnant high number of native plants co-existing with this high number of introductions.

However, some of the non-native species are clearly on their way to gain dominance and it is to be expected that some of the native flora will be lost in the long term as a result of competition with aggressive species. In addition to the long and complicated human disturbance history the vegetation at the National Historic Sites is influenced by an overabundance of coast blacktail deer which have been given exclusive sanctuary, at least in the fenced portion of the properties. Grazing and browsing damage is evident, particularly on shrubs of the Rose family, but also in the abundance distribution of other plants that are preferred deer forage. Examples are the scarcity of *Liliaceae* (other than *Camassia*), *Orchidaceae*, and *Ericaceae* as compared to similar habitats in the Victoria-to-Metchosin area.

Table 2 Vascular Plant Species of Fort Rodd Hill / Fisgard Lighthouse National Historic Site

	Recorded by	y Fai	rbarn	s (F)		
	Recorded by Ro	oeme	r (R)			
ı	ntroduced species (A=adver	ntive)	_	1	1	
Abundance (very commo	on/common/occasional/rare)	V	٧	٧	٧	
Abies grandis	Pinaceae	С		R	F	grand fir
Acer glabrum	Aceraceae	0		R		Rocky Mountain maple
Acer macrophyllum	Aceraceae	С		R	F	bigleaf maple
Achillaea millefolium	Asteraceae	С		R	F	yarrow
Achlys triphylla	Berberidaceae	0		R	F	vanilla-leaf
Adenocaulon bicolor	Asteraceae	0		R	F	pathfinder
Aesculus hippocastanum	Hippocastanaceae	R	Α	R		horse chestnut
Agrostis capillaris	Poaceae	С	Α	R	F	colonial bentgrass
Agrostis gigantea	Poaceae	С	Α	R	F	redtop
Agrostis stolonifera	Poaceae	С	Α	R		creeping bentgrass
Aira caryophyllea	Poaceae	0	Α	R	F	silver hairgrass
Aira praecox	Poaceae	V	Α	R	F	early hairgrass
Alnus rubra	Betulaceae	С		R	F	red alder
Alopecurus carolinianus	Poaceae	R		R		Carolina meadow-foxtail
Alopecurus pratensis	Poaceae	0	Α	R		meadow-foxtail
Ambrosia chamissonis	Asteraceae	0		R	F	silver burweed
Amelanchier alnifolia	Rosaceae	0		R	F	saskatoon
Anemone Iyallii	Ranunculaceae	0		R		Lyall's anemone
Angelica genuflexa	Apiaceae	0		R		kneeling angelica
Anthoxanthum odoratum	Poaceae	V	Α	R	F	sweet vernalgrass
Anthriscus caucalis	Apiaceae	V	Α	R	F	bur chervil
Aphanes arvensis	Rosaceae	С		R	F	field parsley-piert
Aphanes microcarpa	Rosaceae	0	Α	R		small-fruited parsley-piert
Arabidopsis thaliana	Brassicaceae	R	Α	R		mouse ear
Arbutus menziesii	Ericaceae	С		R	F	arbutus
Arenaria serpyllifolia	Caryophyllaceae	0	Α	R		thyme-leaved sandwort
Armeria maritima	Plumbaginaceae	0		R	F	thrift
Arrhenatherum elatius	Poaceae	С	Α	R		tall oatgrass
Athyrium filix-femina	Dryopteridaceae	0		R	F	lady fern
Aubrieta deltoides	Brassicaceae	R	Α	R		aubrieta
Balsamorhiza deltoidea	Asteraceae	R		R		deltoid balsamroot
Barbarea orthoceras	Brassicaceae	0		R		American winter-cress
Bellis perennis	Asteraceae	0	Α	R	F	English daisy
Betula pendula	Betulaceae	R	Α	R		European birch

Blechnum spicant	Blechnaceae	R		R	F	deer fern
Brassica campestris	Brassicaceae	0	Α	R		field mustard
Brodiaea coronaria	Liliaceae	С		R		harvest brodiaea
Bromus carinatus	Poaceae	С		R	F	California brome
Bromus commutatus	Poaceae	0	Α	R		meadow brome
Bromus hordeaceus	Poaceae	V	Α	R	F	soft brome
Bromus racemosus	Poaceae	0	Α	R		smooth brome
Bromus rigidus	Poaceae	С	Α	R	F	rip-gut brome
Bromus sitchensis	Poaceae	0		R		Sitka brome
Bromus sterilis	Poaceae	С	Α	R	F	barren brome
Bromus tectorum	Poaceae	С	Α	R		cheatgrass
Bromus vulgaris	Poaceae	С		R	F	Columbia brome
Cakile edentula	Brassicaceae	С		R	F	American searocket
Calandrinia ciliata	Portulacaceae	0		R		red maids
Callitriche marginata	Callitrichaceae	R		R	F	winged water starwort
Calluna vulgaris	Ericaceae	R	Α	R		common heather
Calypso bulbosa	Orchidaceae	0		R		Calypso orchid
Camassia leichtlinii	Liliaceae	0		R	F	great camas
Camassia quamash	Liliaceae	С		R	F	common camas
Cardamine hirsuta	Brassicaceae	С	Α	R		hairy bitter-cress
Cardamine nuttallii var. nuttallii	Brassicaceae	0		R		Nuttall's bitter-cress
Cardamine oligosperma	Brassicaceae	?			F	little western bitter-cress
Carex deweyana	Cyperaceae	0		R	F	Dewey's sedge
Carex hendersonii	Cyperaceae	0		R	F	Henderson's sedge
Carex inops	Cyperaceae	O		R	F	long-stoloned sedge
Carex lyngbyei	Cyperaceae	0		R		Lyngby's sedge
Carex obnupta	Cyperaceae	С		R		slough sedge
Carex tracyi	Cyperaceae	0		R		Tracy's sedge
Carex unilateralis	Cyperaceae	0		R		one-sided sedge
Cerastium arvense	Caryophyllaceae	0		R	F	field chickweed
Cerastium fontanum ssp.triviale	Caryophyllaceae	?	Α		F	mouse-ear chickweed
Cerastium glomeratum	Caryophyllaceae	С	Α	R		sticky chickweed
Cerastium semidecandrum	Caryophyllaceae	0	Α	R		little chickweed
Cheiranthus cheirii	Brassicaceae	0	Α	R		common wallflower
Chenopodium album	Chenopodiaceae	0	Α	R	F	lamb's-quarters
Cirsium arvense	Asteraceae	0	Α	R	F	Canada thistle
Cirsium vulgare	Asteraceae	0	Α	R	F	bull thistle
Clarkia amoena	Onagraceae	0		R		farewell-to-spring
Claytonia parviflora	Portulacaceae	0		R		streambank springbeauty
Claytonia perfoliata	Portulacaceae	0		R	F	miner's lettuce
Claytonia rubra ssp. depressa	Portulacaceae	R		R		red-stem spring beauty
Claytonia rubra ssp. rubra	Portulacaceae	R		R		red-stem spring beauty
Claytonia sibirica	Portulacaceae	0		R		Siberian miner's lettuce

Collinsis grandifica var. pusills Convolvulus arvensis Convolvulus		T	1			1	
Convolvulus avensis Convol	Clinopodium douglasii	Lamiaceae	0			F	yerba buena
Convolvulus avensis Convolvulus avensis Coralboritza maculata Orchidaceae Orchi	Collinsia grandiflora var. pusilla	Scrophulariaceae	С		R	F	
Cornilorhiza maculata Orchidaceae O	Conioselinum gmelinii	Apiaceae	0		R		Pacific hemlock-parsley
Cormus nutraliii Cornaceae O R F western flowering dogwood Cormus stotonifera Cornaceae O R F vestern flowering dogwood Cortoneaster sp. Rosaceae O R F cotoneaster Cortategus douglasi Rosaceae O A F common hawthorn Crataegus douglasi Rosaceae O A F common hawthorn Cretaegus douglasi Asteraceae O A R smooth hawksbeard Crepis capillaris Asteraceae O A R smooth hawksbeard Crepis capillaris Asteraceae O A R smooth hawksbeard Crepis capillaris Poaceae O A R smooth hawksbeard Crepis capillaris Poaceae O A R F contract-grass Cyrnosurus echinatus Poaceae O A R F shedgehog dogtail Cyrnosurus echinatus Poaceae V A R F contract-grass Dactification Poaceae V A R F contract-grass Dactification Poaceae V A R F contract-grass Daphne sureola Thymeleaceae V A R F spurge-laurel Daucus carota Apiaceae O A R F shedgehog dogtail Deschampsia elongata Thymeleaceae V A R F surge-laurel Deschampsia elongata Poaceae R F shedgehog dogtail Deschampsia elongata Poaceae O A R F shedgehog dogtail Deschampsia elongata Poaceae R F shedgehog dogtail Deschampsia elongata var. spicata Poaceae O A R F shedgehog dogtail Deschampsia elongata var. spicata Poaceae O A R F shedgehog dogtail Deschampsia elongata var. spicata Poaceae O A R F shedgehog dogtail Deschampsia elongata var. spicata Poaceae O A R F shedgehog dogtail Deschampsia elongata var. spicata Poaceae O A R F shed	Convolvulus arvensis	Convolvulaceae	0	Α		F	field bindweed
Comus stolonifera Comaceae Contrological Rosaceae Contrological Rosa	Corallorhiza maculata	Orchidaceae	0		R	F	spotted coralroot
Cotoneaster sp. Rosaceae		Cornaceae	0		R	F	ů ů
Crataegus douglasii Rosaceae C R F black hawthorn Crataegus monogyna Rosaceae O A F Common hawthorn Crepis capillaris Asteraceae O A R F Hedgehog dogtail Cyrosurus echinatus Poaceae C A R F Hedgehog dogtail Cyrosurus echinatus Poaceae V A R F Scotch broom Dactylis glomerata Poaceae V A R F Corchard-grass Danthonia californica Poaceae O R F California oatgrass Daphne laureola Thymeleaceae V A R F Spurge-laurel Daucus carota Apiaceae O A R F Spurge-laurel Daucus carota Apiaceae O R Menzies' larkspur Deschampsia elongata Poaceae R F Seonthon foxglove Distichilis spicate var. spicata Poaceae R Poaceae R F Seonthon foxglove Distichilis spicate var. spicata Poaceae O R F F Seashore saltgrass Dodecatheon hendersonii Primulaceae C R F Suprage-laurel Draba verna Brassicaceae O A R F Droad-leaved shootingstar Draba verna Brassicaceae O A R F Droad-leaved Shootingstar Draba verna Brassicaceae O A R F Duswildrye Distinction prachycarpum Onagraceae O R R tall annual willow-herb Epipaciis heliborine Orchidaceae O A R F Durple-leaved willowherb Epipaciis heliborine Orchidaceae O A R F Suprage-leaved Willowherb Epipaciis heliborine Orchidaceae O A R F Spurple-leaved willowherb Epipaciis heliborine Orchidaceae O A R F F Woolly eriophyllum Ercaceae R A R Spaceae R Spanish tree heather Ercaceae R A R Spaceae R R R F F Purple-leaved Willowherb Ercaceae R A R F F F F F F F F F F F F F F F F F	Cornus stolonifera						
Cretasegus monogyna Rosaceae	•	Rosaceae		Α			cotoneaster
Crepis capillaris Asteraceae O A R crested dogtail Cynosurus echinatus Poaceae C A R F hedgehog dogtail Cyrisus scoparius Fabaceae V A R F corchard-grass Danthonia californica Danthonia californica Dautus carota Apiaceae O A R F culifornia oatgrass Danthonia californica Dautus carota Apiaceae O A R F spurge-laurel Dautus carota Apiaceae O A R F suite carrot Delphinium menziesii Ranunculaceae O A R F selnder hairgrass Digitalis purpurea Scrophulariaceae O A R F seashore saltgrass Digitalis spicata var. spicata Dodecartheon hendersonii Primulaceae O A R F broad-leaved shootingstar Doraba verma Brassicaceae O A R F plue wildrye Elymus repens Poaceae C R F plue wildrye Elymus repens Poaceae O A R F pupple-leaved willowherb Epipocitis helleborine Orchidaceae O A R F pupple-leaved willowherb Equisetum arvense Equisetaceae O R R A R F pupple-leaved willowherb Erdisetum telmateia Ericaceae R A R F pocal-leaved shootingstar Drada verma Brassicaceae O R R T plue wildrye Elymus repens Poaceae C R F plue wildrye Elymus repens Poaceae O R R T pupple-leaved willowherb Epipocitis helleborine Orchidaceae O R R Spanish tree heather Erdisetum telmateia Erdicaceae R A R F woolly eriophyllum Geraniaceae C A R F woolly eriophyllum Erddium cicutarium Geraniaceae O R F western fescue Festuca cubra sp. arenicola Poaceae O R F western fescue Festuca rubra sp. arenicola Poaceae O R F western fescue Festuca rubra sp. arenicola Poaceae O R F wood strawberry Fritilaria affinis Liliaceae O R C rinkle-awn fescue	Crataegus douglasii	Rosaceae	С		R	F	black hawthorn
Cynosurus cristatus Poaceae Cynosurus echinatus Poaceae Cynosurus echinatus Poaceae Cynosurus echinatus Poaceae Cynosurus echinatus Poaceae Cynosurus Fabaceae Cynosu	Crataegus monogyna	Rosaceae	0	Α		F	common hawthorn
Cynosurus echinatus Poaceae C A R F hedgehog dogtail Cytisus scoparius Fabaceae V A R F Scotch broom Dactylis glomerata Poaceae V A R F orchard-grass Danthonia californica Poaceae O R F California oatgrass Daphne laureola Thymeleaceae V A R F spurge-laurel Daucus carota Apiaceae O A R F wild carrot Delphinium menziesii Ranunculaceae R N F scommon foxglove Distibihis spicata var. spicata Dodecatheon hendersonii Primulaceae O A R F broad-leaved shootingstar Draba verna Brassicaceae O A R F proad-leaved shootingstar Draba verna Brassicaceae O A R F quackgrass Distibihis repens Poaceae O A R F quackgrass Dodecatheon hendersonii Draba verna Brassicaceae O A R F puackgrass Dodecatheon hendersonii Draba verna Brassicaceae O A R F puackgrass Draba verna Brassicaceae O A R F quackgrass Dodecatheon hendersonii Draba verna Brassicaceae O A R F puackgrass Draba verna Brassicaceae O A R F quackgrass Draba verna Draba verna Brassicaceae O A R F puackgrass Draba verna Brassicaceae O A R F quackgrass Draba verna Draba verna Brassicaceae O A R F quackgrass Draba verna Draba verna Draba verna Draba verna Brassicaceae O A R F quackgrass Draba verna Draba verna Draba verna Draba verna Draba verna Brassicaceae O A R F quackgrass Draba verna D	Crepis capillaris	Asteraceae	0	Α	R		smooth hawksbeard
Cytisus scoparius	Cynosurus cristatus	Poaceae	0	Α	R		crested dogtail
Dactylis glomerata Poaceae V A R F orchard-grass Danthonia californica Poaceae O R F California oatgrass Daphne laureola Thymeleaceae V A R F spurge-laurel Daucus carota Apiaceae O A R F wild carrot Delphinium menziesii Ranunculaceae O A R F sulrege-laurel Deschampsia elongata Deschampsia elongata Doscaea R F selender hairgrass Digitalis purpurea Districtis spicata var. spicata Poaceae O A R F common foxglove Districtis spicata var. spicata Dodecatheon hendersonii Primulaceae O A R F broad-leaved shootingstar Draba verma Brassicaceae O A R F blue wildryve Elymus glaucus Poaceae C R F blue wildryve Elymus repens Poaceae O A R F quackgrass Epilobium brachycarpum Onagraceae O A R F purple-leaved willowherb Epipactis helleborine Orchidaceae O A R F helleborine Equisetum arvense Equisetum telmateia Equisetum telmateia Equisetum telmateia Equisetum telmatum Asteraceae O R A R F common horsetail Erica cf. australis Ericaceae R A R Spanish tree heather Eriophyllum lanatum Asteraceae O R F woolly eriophyllum Erythronium oregonum Liliaceae O R F wite fawn lily Fagaceae R A R European beech Festuca rubra ssp. arenicola Festuca rubra ssp. arenicola Foaceae O R F wood strawberry Fritilaria affinis Liliaceae O R F fwood strawberry Fritilaria affinis Liliaceae O R F fwood strawberry Fritilaria affinis	Cynosurus echinatus	Poaceae	С	Α	R	F	hedgehog dogtail
Danthonia californica Poaceae O R F California oatgrass Daphne laureola Thymeleaceae V A R F spurge-laurel Daucus carota Apiaceae O A R F wild carrot Delphinium menziesii Ranunculaceae O R Menzies' larkspur Deschampsia elongata Poaceae R F selender hairgrass Digitalis purpurea Scrophulariaceae O A R F common foxglove Distichlis spicata var. spicata Dodecatheon hendersonii Primulaceae O A R F broad-leaved shootingstar Draba verna Brassicaceae O A R F blue wildrye Elymus repens Poaceae O A R F quackgrass Epipobium brachycarpum Onagraceae O A R F purple-leaved willow-herb Epipobium ciliatum ssp. ciliatum Onagraceae O A F helleborine Equisetum arvense Equisetaceae O R R S painsh tree heather Ericac a. australis Ericaceae R A R E common horsetail Ericaceae R A R S panish tree heather Eriophyllum lanatum Asteraceae O R R F woolly eriophyllum Erodium cicutarium Geraniaceae R A R E common stork's-bill Erythronium oregonum Liliaceae O R F white fawn lify Fagus sylvatica Fagaceae R A R E common stork's-bill Erythronium oregonum Liliaceae O R F white fawn lify Fagus sylvatica Fagaceae R A R E common stork's-bill Erythronium oregonum Liliaceae O R F white fawn lify Fagus sylvatica Fagaceae O R F western fescue Festuca rubra ssp. arenicola Poaceae O R F woold strawberry Fritilaria affinis Liliaceae O R F woold strawberry Fritilaria affinis Liliaceae O R F chocolate lily	Cytisus scoparius	Fabaceae	٧	Α	R	F	Scotch broom
Daphne laureola Thymeleaceae V A R F spurge-laurel Daucus carota Apiaceae O A R F wild carrot Delphinium menziesii Ranunculaceae O R Menzies' larkspur Deschampsia elongata Poaceae R F slender hairgrass Digitalis purpurea Scrophulariaceae O A R F common foxglove Distichlis spicata var. spicata Poaceae O A R F seashore saltgrass Dodecatheon hendersonii Primulaceae C R F broad-leaved shootingstar Draba verna Brassicaceae O A R F common whitlow grass Elymus glaucus Poaceae C R F blue wildrye Elymus repens Poaceae O A R F quackgrass Epilobium brachycarpum Onagraceae O A R F quackgrass Epilobium brachycarpum Onagraceae O A R F purple-leaved willowherb Epipiactis helleborine Equisetum arvense Equisetum arvense Equisetum arvense Equisetaceae O R giant horsetail Erica cf. australis Ericaceae R A R Spanish tree heather Ericaphyllum lanatum Asteraceae O R F woolly eriophyllum Erodlum cicutarium Geraniaceae C A R F common stork's-bill Erythronium oregonum Liliaceae O R F western fescue Festuca occidentalis Poaceae O R F restruca fescue Festuca rubra ssp. arenicola Poaceae O R F restrucale illy	Dactylis glomerata	Poaceae	٧	Α	R	F	orchard-grass
Daucus carota Apiaceae O A A R F wild carrot Delphinium menziesii Ranunculaceae O R Menzies' larkspur Deschampsia elongata Poaceae R F Slender hairgrass Digitalis purpurea Scrophulariaceae O R F Seashore saltgrass Dodecatheon hendersonii Primulaceae C R F Seashore saltgrass Dodecated shootingstar Draba verna Brassicaceae C R F Succempon whitlow grass Elymus repens Poaceae C R F Sulue wildrye Elymus repens Poaceae C R S Seashore saltgrass Dodecated shootingstar Draba verna C R Seashore saltgrass Dodecated shootingstar Draba verna C R Seashore saltgrass Dodecated shootingstar Draba verna C R S Seashore saltgrass Dodecated shootingstar Draba verna C R S Seashore saltgrass Dodecated shootingstar Draba verna C R S Seashore saltgrass Dodecated shootingstar Doaceae C R S S S S S S S S S S S S S S S S S S	Danthonia californica	Poaceae	0		R	F	California oatgrass
Delphinium menziesii Ranunculaceae	Daphne laureola	Thymeleaceae	٧	Α	R	F	spurge-laurel
Deschampsia elongata Poaceae R F F slender hairgrass Digitalis purpurea Scrophulariaceae O A R F common foxglove Districhlis spicata var. spicata Poaceae O R F seashore saltgrass Dodecatheon hendersonii Primulaceae C R F broad-leaved shootingstar Draba verma Brassicaceae O A R C common whitlow grass Elymus glaucus Poaceae C R F blue wildrye Elymus repens Poaceae O A R F quackgrass Epilobium brachycarpum Onagraceae O R tall annual willow-herb Epilobium brachycarpum Onagraceae O A F helleborine Epilobium ciliatum ssp. ciliatum Onagraceae O A F helleborine Equisetum arvense Equisetaceae O R giant horsetail Equisetum telmateia Equisetaceae O R giant horsetail Erica cf. australis Ericaceae R A R Spanish tree heather Eriophyllum lanatum Asteraceae C A R F common stork's-bill Erythronium oregonum Liliaceae O R F white fawn lity Fagus sylvatica Fagaceae R A R European beech Festuca cubra ssp. arenicola Poaceae O R native red fescue Festuca subulitora Poaceae O R crinkle-awn fescue Frestuca subulitora Poaceae O R F wood strawberry Fritillaria affinis Liliaceae O R F wood strawberry Fritillaria affinis Liliaceae O R F wood strawberry Fritillaria affinis Liliaceae O R F chocolate lily	Daucus carota	Apiaceae	0	Α	R	F	wild carrot
Digitalis purpurea Scrophulariaceae O A R F common foxglove Distichlis spicata var. spicata Poaceae O R F seashore saltgrass Dodecatheon hendersonii Primulaceae C R F broad-leaved shootingstar Draba verna Brassicaceae O A R common whitlow grass Elymus glaucus Poaceae C R F blue wildrye Elymus graceae O A R F quackgrass Elymus repens Poaceae O R tall annual willow-herb Epilobium brachycarpum Onagraceae O R tall annual willow-herb Epilobium ciliatum ssp. ciliatum Onagraceae O A F helleborine Equisetum arvense Equisetaceae O R giant horsetail Equisetum telmateia Equisetaceae O R Spanish tree heather Erica cf. australis Ericaceae R A R Spanish tree heather Erodium cicutarium Geraniaceae C A R F common stork's-bill Erythronium oregonum Liliaceae R A R European beech Festuca occidentalis Poaceae O R inative red fescue Festuca rubra ssp. arenicola Poaceae O R inative red fescue Festuca subuliflora Poaceae O R F wood strawberry Fitillaria affinis Liliaceae O R F wood strawberry Fitillaria affinis Liliaceae O R F wood strawberry Fitillaria affinis Liliaceae O R F wood strawberry Fitillaria affinis Liliaceae O R F wood strawberry Fitillaria affinis	Delphinium menziesii	Ranunculaceae	0		R		Menzies' larkspur
Distichlis spicata var. spicata Poaceae O R F seashore saltgrass Dodecatheon hendersonii Primulaceae O A R F broad-leaved shootingstar C C R F blue wildrye Elymus glaucus Poaceae C R F blue wildrye Elymus repens Poaceae O A R F quackgrass Epilobium brachycarpum Onagraceae O R I tall annual willow-herb Epilobium ciliatum ssp. ciliatum Onagraceae Poaceae O A F helleborine Equisetum arvense Equisetaceae O R G Graniaceae O R Spanish tree heather Ericac f. australis Ericaceae R A R Spanish tree heather Eriophyllum lanatum Asteraceae C A R F woolly eriophyllum Erodium cicutarium Geraniaceae C A R F white fawn lily Fagus sylvatica Fagaceae R A R European beech Festuca occidentalis Poaceae O R F red fescue Festuca rubra Poaceae O R F red fescue Festuca subuliflora Poaceae O R F woodstrawberry Fritillaria affinis Liliaceae O R F chocolate lily	Deschampsia elongata	Poaceae	R			F	slender hairgrass
Dodecatheon hendersonii Primulaceae C R F broad-leaved shootingstar Draba verna Brassicaceae O A R common whitlow grass Elymus glaucus Poaceae C R F blue wildrye Elymus repens Poaceae O A R F quackgrass Epilobium brachycarpum Onagraceae O R tall annual willow-herb Epilobium ciliatum ssp. ciliatum Onagraceae O A F purple-leaved willowherb Epipactis helleborine Orchidaceae O A F helleborine Equisetum arvense Equisetaceae O R common horsetail Equisetum telmateia Equisetaceae O R Spanish tree heather Erica cf. australis Ericaceae R A R Spanish tree heather Eriophyllum lanatum Asteraceae O R F woolly eriophyllum Erodium cicutarium Geraniaceae C A R F common stork's-bill Erythronium oregonum Liliaceae O R F white fawn lily Fagus sylvatica Fagaceae R A R European beech Festuca rubra Sp. arenicola Poaceae O R restuca subuliflora Poaceae Festuca subuliflora Poaceae Rosaceae O R F woodstrawberry Fritillaria affinis Liliaceae O R F woodstrawberry Fritillaria affinis Liliaceae O R F woodstrawberry Fritillaria affinis Liliaceae O R F chocolate lily	Digitalis purpurea	Scrophulariaceae	0	Α	R	F	common foxglove
Draba verna Brassicaceae C R F blue wildrye Elymus repens Poaceae C R F cuackgrass Epilobium brachycarpum C R C R F cuackgrass Epilobium brachycarpum C C R C R F cuackgrass Epilobium brachycarpum C C R C R F cuackgrass Elymus repens C R C R F cual annual willow-herb Epipactis helleborine C C C R F common horsetail C C C R C C C C C C R F C C C C C C C C	Distichlis spicata var. spicata	Poaceae	0		R	F	seashore saltgrass
Elymus glaucus Poaceae C R F blue wildrye Elymus repens Poaceae O A R F quackgrass Epilobium brachycarpum Onagraceae O R Itall annual willow-herb Epilobium ciliatum ssp. ciliatum Onagraceae Porchidaceae O A F Pourple-leaved willowherb Epipactis helleborine Orchidaceae O R Common horsetail Equisetum arvense Equisetaceae O R Giant horsetail Erica cf. australis Ericaceae R A R Spanish tree heather Eriophyllum lanatum Asteraceae O R F woolly eriophyllum Erodium cicutarium Geraniaceae C A R F white fawn lily Fagus sylvatica Fagaceae R A R European beech Festuca occidentalis Poaceae O R F western fescue Festuca rubra Poaceae O R R richiche-awn fescue Fragaria vesca Rosaceae O R F woodstrawberry Fritillaria affinis Liliaceae O R F woodstrawberry Fritillaria affinis	Dodecatheon hendersonii	Primulaceae	С		R	F	broad-leaved shootingstar
Elymus repens Poaceae O A R F quackgrass Epilobium brachycarpum Onagraceae O R tall annual willow-herb Epilobium ciliatum ssp. ciliatum Onagraceae ? F purple-leaved willowherb Epipactis helleborine Orchidaceae O A F helleborine Equisetum arvense Equisetaceae O R common horsetail Equisetum telmateia Equisetaceae O R giant horsetail Erica cf. australis Ericaceae R A R Spanish tree heather Eriophyllum lanatum Asteraceae O F woolly eriophyllum Erodium cicutarium Geraniaceae C A R F common stork's-bill Erythronium oregonum Liliaceae O R F white fawn lily Fagus sylvatica Fagaceae R A R European beech Festuca occidentalis Poaceae O R F western fescue Festuca rubra Poaceae O R F red fescue Festuca subuliflora Poaceae O R F restuce fescue Frestuca subuliflora Poaceae O R F wood strawberry Fritillaria affinis Liliaceae O R F wood strawberry Fritillaria affinis Liliaceae O R F chocolate lily	Draba verna	Brassicaceae	0	Α	R		common whitlow grass
Epilobium brachycarpum Onagraceae O R tall annual willow-herb Epilobium ciliatum ssp. ciliatum Onagraceae ? F purple-leaved willowherb Epipactis helleborine Orchidaceae O A F helleborine Equisetum arvense Equisetaceae O R common horsetail Equisetum telmateia Equisetaceae O R giant horsetail Erica cf. australis Ericaceae R A R Spanish tree heather Eriophyllum lanatum Asteraceae O R woolly eriophyllum Erodium cicutarium Geraniaceae C A R F common stork's-bill Erythronium oregonum Liliaceae O R F white fawn lily Fagus sylvatica Fagaceae R A R European beech Festuca occidentalis Poaceae O R F western fescue Festuca rubra ssp. arenicola Poaceae O R Crinkle-awn fescue Fragaria vesca Rosaceae O R F wood strawberry Fritillaria affinis Liliaceae O R F chocolate lily	Elymus glaucus	Poaceae	С		R	F	blue wildrye
Epilobium ciliatum ssp. ciliatum Onagraceae ? F purple-leaved willowherb Epipactis helleborine Orchidaceae O A F helleborine Equisetum arvense Equisetaceae O R common horsetail Equisetum telmateia Equisetaceae R A R Spanish tree heather Erica cf. australis Ericaceae Ericaceae C A R F common stork's-bill Erythronium oregonum Liliaceae C A R European beech Festuca occidentalis Poaceae Poaceae O R European beech Festuca rubra Festuca rubra Poaceae O R F western fescue Festuca rubra Poaceae O R F wood strawberry Fritillaria affinis Liliaceae O R F wood strawberry Fritillaria affinis Liliaceae O R F chocolate lily	Elymus repens	Poaceae	0	Α	R	F	quackgrass
Epipactis helleborine Orchidaceae O A F helleborine Equisetum arvense Equisetaceae O R common horsetail Equisetum telmateia Equisetaceae O R giant horsetail Erica cf. australis Ericaceae R A R Spanish tree heather Eriophyllum lanatum Asteraceae O F woolly eriophyllum Erodium cicutarium Geraniaceae C A R F common stork's-bill Erythronium oregonum Liliaceae O R F white fawn lily Fagus sylvatica Fagaceae R A R European beech Festuca occidentalis Poaceae O R F western fescue Festuca rubra Sp. arenicola Poaceae O R native red fescue Festuca subuliflora Poaceae O R F wood strawberry Fritillaria affinis Liliaceae O R F chocolate lily	Epilobium brachycarpum	Onagraceae	0		R		tall annual willow-herb
Equisetum arvense Equisetaceae O R common horsetail Equisetum telmateia Equisetaceae O R giant horsetail Erica cf. australis Ericaceae R A R Spanish tree heather Eriophyllum lanatum Asteraceae O F woolly eriophyllum Erodium cicutarium Geraniaceae C A R F common stork's-bill Erythronium oregonum Liliaceae O R F white fawn lily Fagus sylvatica Fagaceae R A R European beech Festuca occidentalis Poaceae O R F western fescue Festuca rubra Poaceae O R F red fescue Festuca rubra ssp. arenicola Poaceae O R native red fescue Festuca subuliflora Poaceae O R F wood strawberry Fritillaria affinis Liliaceae O R F chocolate lily	Epilobium ciliatum ssp. ciliatum	Onagraceae	?			F	purple-leaved willowherb
Equisetum telmateia Equisetaceae O R giant horsetail Erica cf. australis Ericaceae R A R Spanish tree heather Eriophyllum lanatum Asteraceae O F woolly eriophyllum Erodium cicutarium Geraniaceae C A R F common stork's-bill Erythronium oregonum Liliaceae O R F white fawn lily Fagus sylvatica Fagaceae R A R European beech Festuca occidentalis Poaceae O R F western fescue Festuca rubra Poaceae O A R F red fescue Festuca rubra ssp. arenicola Poaceae O R crinkle-awn fescue Frestuca subuliflora Poaceae O R F wood strawberry Fritillaria affinis Liliaceae O R F chocolate lily	Epipactis helleborine	Orchidaceae	0	Α		F	helleborine
Erica cf. australis Ericaceae C A R F woolly eriophyllum Erodium cicutarium Erodium cicutarium Erodium cicutarium Erythronium oregonum Liliaceae O R F white fawn lily European beech Festuca occidentalis Poaceae O R F western fescue Festuca rubra Poaceae O A R F red fescue Festuca rubra ssp. arenicola Poaceae O R native red fescue Festuca subuliflora Poaceae O R F wood strawberry Fritillaria affinis Liliaceae O R F chocolate lily	Equisetum arvense	Equisetaceae	0		R		common horsetail
Eriophyllum lanatum Asteraceae O F woolly eriophyllum Erodium cicutarium Geraniaceae C A R F common stork's-bill Erythronium oregonum Liliaceae O R F white fawn lily Fagus sylvatica Fagaceae R A R European beech Festuca occidentalis Poaceae O R F western fescue Festuca rubra Festuca rubra ssp. arenicola Poaceae O R native red fescue Festuca subuliflora Poaceae O R red fescue Festuca subuliflora Foaceae O R red fescue Frestuca subuliflora Poaceae O R red fescue Frestuca subuliflora Foaceae O R red fescue Frestuca subuliflora Foaceae O R red fescue Frestuca subuliflora Poaceae O R red fescue Frestuca subuliflora Foaceae O R F wood strawberry Fritillaria affinis	Equisetum telmateia	Equisetaceae	0		R		giant horsetail
Erodium cicutarium Geraniaceae C A R F common stork's-bill Erythronium oregonum Liliaceae O R F white fawn lily Fagus sylvatica Fagaceae R A R European beech Festuca occidentalis Poaceae O A R F western fescue Festuca rubra Festuca rubra ssp. arenicola Poaceae O R native red fescue Festuca subuliflora Poaceae O R crinkle-awn fescue Fragaria vesca Rosaceae O R F wood strawberry Fritillaria affinis Liliaceae O R F chocolate lily	Erica cf. australis	Ericaceae	R	Α	R		Spanish tree heather
Erythronium oregonum Liliaceae O R F white fawn lily Fagus sylvatica Fagaceae R A R European beech Festuca occidentalis Poaceae O R F western fescue Festuca rubra Poaceae O R F red fescue Festuca rubra ssp. arenicola Poaceae O R native red fescue Festuca subuliflora Poaceae O R crinkle-awn fescue Fragaria vesca Rosaceae O R F wood strawberry Fritillaria affinis Liliaceae O R F chocolate lily	Eriophyllum lanatum	Asteraceae	0			F	woolly eriophyllum
Fagus sylvatica Fagus eae R A R European beech Festuca occidentalis Poaceae O A R F western fescue Festuca rubra Festuca rubra ssp. arenicola Poaceae O R native red fescue Festuca subuliflora Poaceae O R crinkle-awn fescue Fragaria vesca Rosaceae O R F wood strawberry Fritillaria affinis Liliaceae O R F chocolate lily	Erodium cicutarium	Geraniaceae	С	Α	R	F	common stork's-bill
Festuca occidentalis Poaceae O R F western fescue Festuca rubra Poaceae O A R F red fescue Festuca rubra ssp. arenicola Poaceae O R native red fescue Festuca subuliflora Poaceae O R crinkle-awn fescue Fragaria vesca Rosaceae O R F wood strawberry Fritillaria affinis Liliaceae O R F chocolate lily	Erythronium oregonum	Liliaceae	0		R	F	white fawn lily
Festuca rubra Poaceae O A R F red fescue Festuca rubra ssp. arenicola Poaceae O R native red fescue Festuca subuliflora Poaceae O R crinkle-awn fescue Fragaria vesca Rosaceae O R F wood strawberry Fritillaria affinis Liliaceae O R F chocolate lily	Fagus sylvatica	Fagaceae	R	Α	R		European beech
Festuca rubra ssp. arenicola Poaceae O R native red fescue Crinkle-awn fescue Fragaria vesca Rosaceae O R Fritillaria affinis Liliaceae O R rative red fescue Crinkle-awn fescue	Festuca occidentalis	Poaceae	0		R	F	western fescue
Festuca subuliflora Poaceae OR Rosaceae	Festuca rubra	Poaceae	0	Α	R	F	red fescue
Fragaria vesca Rosaceae O R F wood strawberry Fritillaria affinis Liliaceae O R F chocolate lily	Festuca rubra ssp. arenicola	Poaceae	0		R		native red fescue
Fritillaria affinis Liliaceae O R F chocolate lily	Festuca subuliflora	Poaceae	0		R		crinkle-awn fescue
	Fragaria vesca	Rosaceae	0		R	F	wood strawberry
Galium aparine Rubiaceae C A R F cleavers	Fritillaria affinis	Liliaceae	0		R	F	chocolate lily
	Galium aparine	Rubiaceae	С	Α	R	F	cleavers

Gallum inflorum Rubiaceae C R F F salal Garinteria shallon Ericaceae C C R F Salal Garinteria shallon Ericaceae C C R F Salal Garinteria shallon Ericaceae C C A R F Galla Garinteria shallon Geraniaceae C A R F Goverbot geranium Geranium pusillum Geraniaceae C A R F Goverbot geranium Geranium pusillum Geraniaceae C A R F herb-Robert Geranium robertianum Geraniaceae C A R F herb-Robert Geranium pusillum Rosaceae C A R F herb-Robert Geranium Robertianum Geraniaceae C A R F herb-Robert Geranium Robertianum Geranium Robertianum Geranium Robertianum Robertia	Calium triflarum	Dubiasas	С		D	F	supply approach by datrour
Geranium dissectum Geraniaceae O A R F Cut-leaved geranium							
Geranium molle Geraniaceae C A R F dovefoot geranium Geranium pusillum Geraniaceae ? A F small-flowered geranium Geranium pusillum Geraniaceae C A R F small-flowered geranium Geranium robertianum Geraniaceae C A R F small-flowered geranium Geranium mecrophyllum Rosaceae O R F sae-milkwort Glaux maritima Primulaceae O R F sae-milkwort Glaux maritima Primulaceae O R R F sae-milkwort Graphalium palustre Asteraceae R R R owland cudweed Goodyera oblongifolia Orchidaceae O R F trattensake-plantain Gratiola ebracteata Scrophulariaceae R R R F bract-less hedge-hyssop Grindelia integritolia Asteraceae C R R F Puget Sound gumweed Hedera helix Araliaceae O A R F English ivy Heuchera micrantha Saxifragaceae O R F small-flowered alumroot Hieracium albiflorum Asteraceae O R F small-flowered alumroot Hieracium albiflorum Asteraceae C C R F common velvet-grass Holodiscus discolor Rosaceae C A R F common velvet-grass Holodiscus discolor Rosaceae C A R F common velvet-grass Holodiscus discolor Rosaceae C A R F meadow barley Hordeum brachyantherum Poaceae C A R mouse barley Hyacinthoides non-scripta Liliaceae O A R English bluebell Hypericum alycinum C Clusiaceae R A R English bluebell Hypericum olympicum C Clusiaceae R A R English bluebell Hypericum olympicum C Clusiaceae R A R English bluebell Hippericum olympicum Supplicum Aquifoliaceae C A R F English bloty Isoceta nutallii Isocetaceae O R R English bluebell Hippericum olympicum Aquifoliaceae C A R F English bluebell Hippericum olympicum Aquifoliaceae C A R F English bluebell Hippericum olympicum Aquifoliaceae C A R F F English bluebell Hippericum olympicum Aquifoliaceae C A R F F English bluebell Hippericum olympicum Aquifoliaceae C A R F F English bluebell Hippericum olympicum Aquifoliaceae C A R F F English bluebell Hippericum olympicum Aquifoliaceae C A R F F English bluebell Hippericum olympicum Aquifoliaceae C A R F F English bluebell Hippericum olympicum Agaiceae O A R R F English bluebell Hippericum olympicum Agaiceae O A R R F English bluebell Hippericum olympicum Ag				Δ			
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Gnaphallum palustre	, ,						
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Asteraceae C R F Puget Sound gumweed	Goodyera oblongifolia	Orchidaceae			R	F	rattlesnake-plantain
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Holocus lanatus Poaceae C R F C R F Common velvet-grass C R F Coceanspray Hordeum brachyantherum Poaceae C R F F Coceanspray Hordeum brachyantherum Poaceae C R R F C R F C R F R F Regish bluebell Hypericum calycinum Clusiaceae R R R R St.John's wort Hypericum olympicum Clusiaceae C R R R F Rairy cat's-ear Ilex aquifolium Aquifoliaceae C R R Nuttall's quillwort Isoetes nutallii Isoetes nutallii Isoetaceae O R R Baltic rush Juncus balticus Juncaceae O R R Baltic rush Juncus effusus Juncaceae O R Common rush Juncus ensifolius Juncaceae O R C C C R C C C C R C C C R C C C C R C C C C R C C C C R C C C C R C C C C R C C C C R C C C C R C C C C R C C C C R C C C C R C C C C R C C C C R C C C R C C C C R C	Heuchera micrantha	Saxifragaceae	0		R	F	small-flowered alumroot
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Hyacinthoides non-scripta Liliaceae O A R English bluebell Hypericum calycinum Clusiaceae O A R St.John's wort Hypericum olympicum Clusiaceae R A R St.John's wort Hypochaeris radicata Asteraceae C A R F hairy cat's-ear Ilex aquifolium Aquifoliaceae C A R F English holly Isoetes nutallii Isoetaceae O R Nuttall's quillwort Juncus balticus Juncaceae O R Baltic rush Juncus bufonius Juncaceae O A R common rush Juncus erfiusus Juncaceae O R dagger-leaf rush Juncus gerardii Juncaceae O R F Gerard's rush Kolkwitzia amabilis Caprifoliaceae R A R beauty bush Laburnum anagyroides Fagaceae O A R Iaburnum Lactuca muralis Asteraceae C A R F purple dead-nettle Lapsana communis Lathyrus japonicus Fabaceae O R F purple peavine	Hordeum brachyantherum	Poaceae	0		R	F	meadow barley
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Hypericum olympicum Clusiaceae R A R St.John's wort Hypochaeris radicata Asteraceae C A R F hairy cat's-ear Ilex aquifolium Aquifoliaceae C A R F English holly Isoetes nutallii Isoetaceae O R Nuttall's quillwort Juncus balticus Juncaceae O R Baltic rush Juncus bufonius Juncaceae O A R common rush Juncus ensifolius Juncaceae O R dagger-leaf rush Juncus gerardii Juncaceae O R F Gerard's rush Kolkwitzia amabilis Caprifoliaceae R A R beauty bush Laburnum anagyroides Fagaceae O A R iaburnum Lactuca muralis Asteraceae C A R F purple dead-nettle Lapsana communis Asteraceae C A R inipplewort Lathyrus japonicus Fabaceae O R F beach pea	Hyacinthoides non-scripta	Liliaceae	0	Α	R		English bluebell
Hypochaeris radicata Asteraceae C A R F hairy cat's-ear Ilex aquifolium Aquifoliaceae C A R F English holly Isoetes nutallii Isoetaceae O R Nuttall's quillwort Juncus balticus Juncaceae O R baltic rush Juncus bufonius Juncaceae O A R common rush Juncus ensifolius Juncaceae O R dagger-leaf rush Juncus gerardii Juncaceae O R F Gerard's rush Kolkwitzia amabilis Caprifoliaceae R A R beauty bush Laburnum anagyroides Fagaceae O A R iburnum Lactuca muralis Asteraceae C A R F wall-lettuce Lamium purpureum Lamiaceae C A R ipurple dead-nettle Lapsana communis Asteraceae C A R ipurple peavine	Hypericum calycinum	Clusiaceae	0	Α	R		St.John's wort
Ilex aquifolium	Hypericum olympicum	Clusiaceae	R	Α	R		St.John's wort
Isoetes nutallii Isoetaceae O R Nuttall's quillwort Juncus balticus Juncaceae O R Baltic rush Juncus bufonius Juncaceae O R toad rush Juncus effusus Juncaceae O R common rush Juncus ensifolius Juncaceae O R dagger-leaf rush Juncus gerardii Juncaceae O R F Gerard's rush Kolkwitzia amabilis Caprifoliaceae R A R beauty bush Laburnum anagyroides Fagaceae O A R laburnum Lactuca muralis Asteraceae C A R F wall-lettuce Lamium purpureum Lamiaceae C A R inipplewort Lathyrus japonicus Fabaceae O R F beach pea Lathyrus nevadensis Fabaceae O R F purple peavine	Hypochaeris radicata	Asteraceae	С	Α	R	F	hairy cat's-ear
Juncus balticus Juncaceae O R Baltic rush Juncus bufonius Juncaceae O R toad rush Juncus effusus Juncaceae O A R common rush Juncus ensifolius Juncaceae O R dagger-leaf rush Juncus gerardii Juncaceae O R F Gerard's rush Kolkwitzia amabilis Caprifoliaceae R A R beauty bush Laburnum anagyroides Fagaceae O A R laburnum Lactuca muralis Asteraceae C A R F wall-lettuce Lamium purpureum Lamiaceae C A R F purple dead-nettle Lathyrus japonicus Fabaceae O R F beach pea Lathyrus nevadensis Fabaceae O R F purple peavine	llex aquifolium	Aquifoliaceae	С	Α	R	F	English holly
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Juncus effusus Juncaceae O A R common rush Juncus ensifolius Juncaceae O R dagger-leaf rush Juncus gerardii Juncaceae O R F Gerard's rush Kolkwitzia amabilis Caprifoliaceae R A R beauty bush Laburnum anagyroides Fagaceae O A R laburnum Lactuca muralis Asteraceae C A R F wall-lettuce Lamium purpureum Lamiaceae C A R F purple dead-nettle Lapsana communis Asteraceae C A R nipplewort Lathyrus japonicus Fabaceae O R F beach pea Lathyrus nevadensis Fabaceae O R F purple peavine	Juncus balticus	Juncaceae	0		R		Baltic rush
Juncus ensifolius Juncaceae O R dagger-leaf rush Juncus gerardii Juncaceae O R F Gerard's rush Kolkwitzia amabilis Caprifoliaceae R A R beauty bush Laburnum anagyroides Fagaceae O A R Iaburnum Lactuca muralis Asteraceae C A R F wall-lettuce Lamium purpureum Lamiaceae C A R F purple dead-nettle Lapsana communis Asteraceae C A R nipplewort Lathyrus japonicus Fabaceae O R F purple peavine Lathyrus nevadensis Fabaceae O R F purple peavine	Juncus bufonius	Juncaceae	0		R		toad rush
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Kolkwitzia amabilis Caprifoliaceae R A R beauty bush Laburnum anagyroides Fagaceae O A R laburnum Lactuca muralis Asteraceae C A R F wall-lettuce Lamium purpureum Lamiaceae C A R F purple dead-nettle Lapsana communis Asteraceae C A R nipplewort Lathyrus japonicus Fabaceae O R F beach pea Lathyrus nevadensis Fabaceae O R F purple peavine	Juncus ensifolius	Juncaceae	0		R		dagger-leaf rush
Laburnum anagyroides Fagaceae O A R laburnum Lactuca muralis Asteraceae C A R F wall-lettuce Lamium purpureum Lamiaceae C A R F purple dead-nettle Lapsana communis Asteraceae C A R nipplewort Lathyrus japonicus Fabaceae O R F beach pea Lathyrus nevadensis Fabaceae O R F purple peavine	Juncus gerardii	Juncaceae	0		R	F	Gerard's rush
Lactuca muralis Asteraceae C A R F wall-lettuce Lamium purpureum Lamiaceae C A R F purple dead-nettle Lapsana communis Asteraceae C A R nipplewort Lathyrus japonicus Fabaceae O R F purple peavine	Kolkwitzia amabilis	Caprifoliaceae	R	Α	R		beauty bush
Lamium purpureum Lamiaceae C A R F purple dead-nettle Lapsana communis Asteraceae C A R nipplewort Lathyrus japonicus Fabaceae O R F beach pea Lathyrus nevadensis Fabaceae O R F purple peavine	Laburnum anagyroides	Fagaceae	0	Α	R		laburnum
Lapsana communis Asteraceae C A R nipplewort Lathyrus japonicus Fabaceae O R F beach pea Lathyrus nevadensis Fabaceae O R F purple peavine	Lactuca muralis	Asteraceae	С	Α	R	F	wall-lettuce
Lathyrus japonicus Fabaceae O R F beach pea Lathyrus nevadensis Fabaceae O R F purple peavine	Lamium purpureum	Lamiaceae	С	Α	R	F	purple dead-nettle
Lathyrus nevadensis Fabaceae O R F purple peavine	Lapsana communis	Asteraceae	С	Α	R		nipplewort
	Lathyrus japonicus	Fabaceae	0		R	F	beach pea
	Lathyrus nevadensis	Fabaceae	0		R	F	purple peavine
	Leontodon taraxacoides	Asteraceae	С	Α	R	F	hairy hawkbit
Lepidium heterophyllum Brassicaceae O A R Smith's pepper-grass	Lepidium heterophyllum	Brassicaceae	0	Α	R		Smith's pepper-grass
Leucanthemum vulgare Asteraceae O A R F oxeye daisy	Leucanthemum vulgare	Asteraceae	0	Α	R	F	oxeye daisy
Leymus mollis Poaceae C R F dune wildrye	Leymus mollis	Poaceae	С		R		
Lilium columbianum Liliaceae O R Columbia lily	,	Liliaceae	0				•
Limnanthes macounii Limnanthaceae R R F Macoun's meadow-foam						F	,

Linaria canadensis	Scrophulariaceae	0		R		Canadian toadflax
Linnaea borealis	Caprifoliaceae	С		R	F	twinflower
Lithophragma parviflora	Saxifragaceae	0		R	F	small-flowered fringecup
Lolium arundinaceum	Poaceae	R	Α	R	F	tall fescue
Lolium perenne	Poaceae	С	Α	R	F	perennial ryegrass
Lolium pratense	Poaceae	С	Α	R		perennial ryegrass
Lomatium nudicaule	Apiaceae	0		R	F	barestem desert-parsley
Lomatium utriculatum	Apiaceae	0		R	F	spring gold
Lonicera ciliosa	Caprifoliaceae	0		R	F	western trumpet
Lonicera hispidula	Caprifoliaceae	0		R	F	hairy honeysuckle
Lotus micranthus	Fabaceae	0		R		small-flowered birdsfoot trefoil
Lupinus bicolor	Fabaceae	0		R	F	two-coloured lupine
Luzula multiflora	Juncaceae	0		R		field woodrush
Lysichiton americanum	Araceae	R		R		skunk cabbage
Madia madioides	Asteraceae	0		R		woodland tarweed
Madia sp.	Asteraceae	?			F	tarweed
Mahonia aquifolium	Berberidaceae	0		R	F	tall Oregon-grape
Mahonia nervosa	Berberidaceae	V		R	F	dull Oregon-grape
Maianthemum dilatatum	Liliaceae	0		R	F	false lily-of-the-valley
Malus fusca	Rosaceae	0		R	F	Pacific crab apple
Malus pumila	Rosaceae	0	Α	R	F	cultivated apple
Medicago arabica	Fabaceae	С	Α	R	F	spotted medic
Medicago lupulina	Fabaceae	С	Α	R		black medic
Medicago polymorpha	Fabaceae	0	Α	R		bur clover
Melica subulata	Poaceae	С		R	F	Alaska oniongrass
Mentha piperita	Lamiaceae	0	Α	R		peppermint
Mimulus "sookensis"	Scrophulariaceae	0		R		local, undescribed monkeyflower
Mimulus alsinoides	Scrophulariaceae	0		R		chickweed monkeyflower
Mimulus moschatus	Scrophulariaceae	R		R		musk flower
Moehringia macrophylla	Caryophyllaceae	С		R	F	big-leaved sandwort
Montia fontana	Portulacaceae	С		R	F	blinks
Montia howellii	Portulacaceae	R		R		Howell's montia
Montia linearis	Portulacaceae	R		R		narrow-leaved montia
Montia parvifolia	Portulacaceae	0		R	F	small-leaved montia
Myosotis arvensis	Boraginaceae	?	Α		F	field forget-me-not
Myosotis discolor	Boraginaceae	0	Α	R		common forget-me-not
Myosurus minimus	Ranunculaceae	R		R		tiny mousetail
Narcissus poeticus	Liliaceae	R	Α	R		poet's narcissus
Narcissus pseudonarcissus	Liliaceae	0	Α	R		daffodil
Nemophila parviflora	Hydrophyllaceae	0		R	F	small-flowered nemophila
Nemophila pedunculata	Hydrophyllaceae	0		R		meadow nemophila
Oemleria cerasiformis	Rosaceae	С		R	F	Indian-plum
Oenanthe sarmentosa	Apiaceae	0		R	F	Pacific water-parsley

Osmorhiza berteroi	Apiaceae	С		R	F	mountain sweet cicely
Pachistima myrsinites	Celastraceae	0		R		false-box
Pentagramma triangularis	Pteridaceae	0		R	F	goldenback fern
Perideridia gairdneri	Apiaceae	0		R		yampah
Petroselinum crispum	Apiaceae	0	Α	R	F	parsley
Philadelphus lewisii	Hydrangeaceae	0		R		mock orange
Physocarpus capitatus	Rosaceae	0		R		ninebark
Pinus contorta var. contorta	Pinaceae	0		R	F	shore pine
Piperia transversa	Orchidaceae	R		R	F	royal rein orchid
Plagiobothrys scouleri	Boraginaceae	0		R	F	Scouler's popcorn-flower
Plantago elongata	Plantaginaceae	0		R	F	slender plantain
Plantago lanceolata	Plantaginaceae	С	Α	R	F	ribwort plantain
Plantago major	Plantaginaceae	0	Α		F	common plantain
Plantago maritima	Plantaginaceae	0		R	F	sea plantain
Plectritis congesta	Valerianaceae	0		R	F	sea blush
Plectritis macrocera	Valerianaceae	0		R		long-spurred plectritis
Poa annua	Poaceae	С	Α	R	F	annual bluegrass
Poa bulbosa	Poaceae	0	Α	R	F	bulbous bluegrass
Poa palustris	Poaceae	0	Α	R		swamp bluegrass
Poa pratensis	Poaceae	С	Α	R	F	Kentucky bluegrass
Poa trivialis	Poaceae	0	Α	R		rough bluegrass
Polygonum paronychia	Polygonaceae	0		R		beach knotweed
Polypodium glycyrrhiza	Polypodiaceae	С		R	F	licorice fern
Polystichum munitum	Dryopteridaceae	С		R	F	sword fern
Populus tremuloides	Salicaceae	С		R	F	trembling aspen
Populus trichocarpa	Salicaceae	0		R		black cottonwood
Potentilla egedii	Rosaceae	0		R		coast silverweed
Prunella vulgaris	Lamiaceae	0	Α		F	self-heal
Prunus cerasifera nigra	Rosaceae	0	Α	R		Japanese plum
Prunus emarginata	Rosaceae	0		R	F	bitter cherry
Prunus laurocerasus	Rosaceae	0	Α	R	F	cherry-laurel
Prunus Iusitanica	Rosaceae	R	Α	R		Portuguese laurel
Pseudotsuga douglasii	Pinaceae	V		R	F	Douglas-fir
Pteridium aquilinum	Dennstaedticeae	С		R	F	bracken fern
Puccinellia nutkaensis	Poaceae	0		R	F	Pacific alkaligrass
Quercus garryana	Fagaceae	С		R	F	Garry oak
Ranunculus acris	Ranunculaceae	0	Α	R		meadow buttercup
Ranunculus occidentalis	Ranunculaceae	R			F	western buttercup
Ranunculus repens	Ranunculaceae	0	Α	R	F	creeping buttercup
Ranunculus uncinatus	Ranunculaceae	0		R		small buttercup
Rhamnus purshiana	Rhamnaceae	0		R	F	cascara
Rhododendron ponticum s.l.	Ericaceae	R	Α	R		rhododendron
Ribes divaricatum	Grossulariaceae	0		R		coastal black gooseberry

	1	1			1	
Ribes laxiflorum	Grossulariaceae	?			F	trailing black currant
Ribes sanguineum	Grossulariaceae	?			F	red-flowering currant
Rosa eglanteria	Rosaceae	С	Α	R		dog rose
Rosa gymnocarpa	Rosaceae	С		R	F	baldhip rose
Rosa nutkana	Rosaceae	С		R	F	Nootka rose
Rosa pisocarpa	Rosaceae	?			F	clustered wild rose
Rubus discolor	Rosaceae	С	Α	R	F	Himalayan blackberry
Rubus laciniatus	Rosaceae	0	Α	R		cut-leaf blackberry
Rubus parviflorus	Rosaceae	0		R	F	thimbleberry
Rubus spectabilis	Rosaceae	0		R	F	salmonberry
Rubus ursinus	Rosaceae	С		R	F	trailing blackberry
Rumex acetosella	Polygonaceae	С	Α	R	F	sheep sorrel
Rumex conglomeratus	Polygonaceae	0	Α	R	F	clustered dock
Rumex crispus	Polygonaceae	0	Α		F	curled dock
Rumex obtusifolius	Polygonaceae	0	Α	R		bitter dock
Sagina apetala	Caryophyllaceae	0	Α		F	pearlwort
Sagina maxima ssp. procumbens	Caryophyllaceae	0		R		pearlwort
Sagina sp.	Caryophyllaceae	?			F	pearlwort
Salicornia virginica	Chenopodiaceae	0		R	F	American glasswort
Salix hookeriana	Salicaceae	0		R		Hooker's willow
Salix lucida	Salicaceae	0		R		Pacific willow
Salix scouleriana	Salicaceae	С		R	F	Scouler's willow
Salix sitchensis	Salicaceae	0		R		Sitka willow
Sambucus racemosa	Caprifoliaceae	0		R		red elderberry
Sanicula crassicaulis	Apiaceae	С		R	F	Pacific sanicle
Saxifraga integrifolia	Saxifragaceae	0		R	F	grassland saxifrage
Saxifraga tridactylites	Saxifragaceae	0	Α	R	F	rue-leaved saxifrage
Sedum album	Crassulaceae	0	Α	R		white-flowered stonecrop
Sedum lanceolatum var. nesioticum	Crassulaceae	R		R	F	lance-leaved stonecrop
Sedum spathulifolium	Crassulaceae	0		R	F	broad-leaved stonecrop
Selaginella wallacei	Selaginellaceae	С		R	F	Wallace's selaginella
Senecio vulgaris	Asteraceae	0	Α	R	F	common groundsel
Shepherdia canadensis	Eleagnaceae	R		R	F	soopolallie
Sherardia arvensis	Rubiaceae	0	Α	R		field madder
Silene gallica	Caryophyllaceae	С	Α	R		small-flowered catchfly
Solidago canadensis	Asteraceae	0		R		Canadian goldenrod
Sonchus arvensis	Asteraceae	0	Α	R		field sow-thistle
Sonchus oleraceus	Asteraceae	0	Α	R	F	common sow-thistle
Sorbus aucuparia	Rosaceae	0	Α	R	F	European mountain-ash
Spergularia rubra	Caryophyllaceae	0	Α	R		Red sand-spurry
Stachys chamissonis	Lamiaceae	0		R	F	Cooley's hedge-nettle
Stellaria crispa	Caryophyllaceae	0		R		crisp starwort
Stellaria media	Caryophyllaceae	С	Α	R	F	common chickweed

Streptopus lanceolatus	Liliaceae	?			F	rosy twisted-stalk
Symphoricarpos albus	Caprifoliaceae	С		R	F	common snowberry
Symphoricarpos mollis v. hesperius	Caprifoliaceae	С		R		trailing snowberry
Syringa vulgaris	Oleaceae	R	Α		F	lilac
Taraxacum officinale	Asteraceae	0	Α	R	F	common dandelion
Taraxacum sp.	Asteraceae	0		R		dandelion species
Taxus brevifolia	Taxaceae	0		R	F	western yew
Teesdalia nudicaulis	Brassicaceae	С	Α	R	F	shepherd's cress
Tellima grandiflora	Saxifragaceae	0		R	F	fringecup
Thuja plicata	Cupressaceae	0		R	F	western redcedar
Tiarella trifoliata var. trifoliata	Saxifragaceae	0		R	F	three-leaved foamflower
Trientalis borealis ssp. latifolia	Primulaceae	0		R	F	broad-leaved starflower
Trifolium depauperatum	Fabaceae	R		R	F	poverty clover
Trifolium dubium	Fabaceae	С	Α	R	F	small hop-clover
Trifolium microcephalum	Fabaceae	R		R	F	small-headed clover
Trifolium microdon	Fabaceae	R		R	F	thimble clover
Trifolium oliganthum	Fabaceae	R		R		few-flowered clover
Trifolium pratense	Fabaceae	0	Α	R		red clover
Trifolium repens	Fabaceae	0	Α	R	F	white clover
Trifolium subterraneum	Fabaceae	0	Α	R	F	subterranean clover
Trifolium variegatum	Fabaceae	0		R	F	white-tipped clover
Trifolium willdenowii	Fabaceae	0		R	F	tomcat clover
Trifolium wormskjoldii	Fabaceae	R			F	springbank clover
Triglochin maritima	Juncaginaceae	0		R	F	seaside arrowgrass
Trillium ovatum	Liliaceae	0		R	F	western trillium
Triphysaria pusilla	Scrophulariaceae	0		R	F	dwarf owl-clover
Triteleia hyacinthina	Liliaceae	С		R	F	fool's onion
Tsuga heterophylla	Pinaceae	R			F	western hemlock
Ulex europaeus	Fabaceae	С	Α	R	F	gorse
Urtica dioica ssp. gracilis	Urticaceae	0		R	F	stinging nettle
Veronica americana	Scrophulariaceae	0		R		American speedwell
Veronica arvensis	Scrophulariaceae	С	Α	R	F	wall speedwell
Veronica peregrina	Scrophulariaceae	0	Α	R	F	purslane speedwell
Veronica serpyllifolia	Scrophulariaceae	R	Α		F	thyme-leaved speedwell
Vicia hirsuta	Fabaceae	0	Α	R	F	tiny vetch
Vicia lathyroides	Fabaceae	0	Α	R	F	spring vetch
Vicia sativa var. angustifolia	Fabaceae	С	Α	R		narrow-leaved common vetch
Vicia sativa var. cordata	Fabaceae	0	Α	R		Heart-leaved common vetch
Vicia sativa var. sativa	Fabaceae	С	Α	R	F	common vetch
Vinca major	Apocynaceae	0	Α	R		large periwinkle
Viola odorata	Violaceae	0	Α	R		scented violet
Vulpia bromoides	Poaceae	С	Α	R	F	barren fescue
Vulpia myuros	Poaceae	С	Α	R		rat-tail fescue

References

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- Capital Regional District Parks. 2002. A Restoration Plan for Mill Hill Regional Park, Capital Regional District, British Columbia (Draft).
- Ceska, Oldriska and Adolf. 1999 (?). Personal communication, relating efforts to weed out overgrown *Limnanthes macounii* sites at Devonian Regional Park.
- Douglas, George W, G. Straley, D. Meidinger and J. Pojar (eds.). 1998 –2002. Illustrated Flora of British Columbia. Eight volumes. British Columbia Ministry of Environment, Lands and Parks and British Columbia Ministry of Forests.
- Douglas, George W, D.Meidinger and J. Pojar (eds.). 1999. As above, Volume 4.
- Douglas, George W, D.Meidinger and J. Pojar (eds.). 2002. As above, Volume 8

Appendices

- Conservation Data Centre Field Survey Forms for 12 rare plant occurrences
- Figure 1 Location of Rare Plants at Fort Rodd Hill / Fisgard Lighthouse National Historic Site
- Plate 1 Limnanthes macounii / Isoetes nuttallii / Trifolium depauperatum
- Plate 2 Balsamorhiza deltoidea / Claytonia rubra ssp. depressa / Callitriche marginata / Alopecurus carolinianus

Figure 1. Base Map of Study Area 0 m $250\,\mathrm{m}$ $500\,\mathrm{m}$

 $750\,\mathrm{m}$

 $1,000 \mathrm{m}$

scale 1:5,000 (orthorectified)

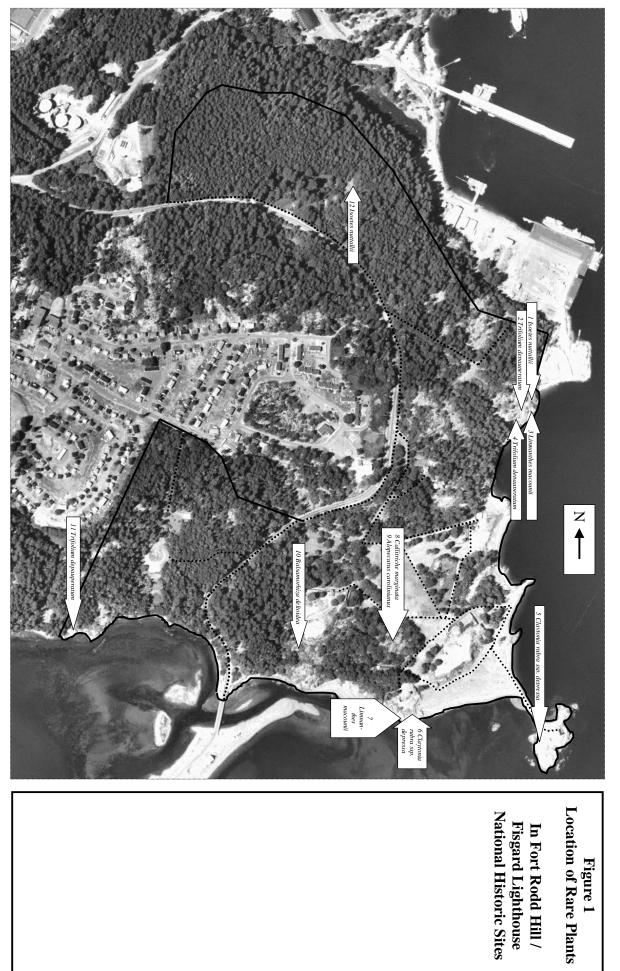


Figure 1
Location of Rare Plants



Limnanthes macounii, habitat in muddy hollow among taller vegetation, Yew Point. Note for scale leaves of Camassia leichtlinii and introduced grasses.



Plate 1



Balsamorhiza deltoidea in site 10, below the Upper Battery, in dappled shade of Garry Oak trees. These leaves are the remnant of a once flowering population.



Callitriche marginata in site 8/9, a vernal pool habitat. Note ballpoint pen for scale

Alopecurus carolinianus, an annual grass, in the same vernal pool habitat



B.C. Conservation Data Centre FIELD SURVEY FORM (PLANTS)

Note: Complete only for Red- or Blue-Listed species. Please fill out as many fields as you can, but precise locality and population data are especially important pieces of information.

Project name:
Fort Rodd
New/Update
Update EO #____

Species:Alopec Roemer	urus carolinianus, site 9	Name of surveyor:Hans
		ive, Victoria, BC V9E 1H7 (250) 479-6470
hroemer@pacificco	past.net	
_		
	nth/Day/year):06 / 10 / 200	
Revisit needed? _ advised_	X_yesno Why?:mon	<u>nitoring</u>
	ion # & Herbarium: (Please	e make a collection; in most cases, a collection is necessary to verify
		Was a photo taken?Y_
		ossible; include photocopies of 1:20,000 trim or 1:50,000 topographic
400 m WNW Commander's Post	of Fisgard Light House. A rais	sed rock outcrop area with central depression to the S of the "Battery
	ace: (from blue grid on 1:50,00	
		(NAD) designation is, found below the contour interval scale on NTS (AD designation; CDC Mapping uses NAD 83 data)
70NF (e.g. 1011)	I at 48° 25' 55'	6" Long 123 °27' 07.8" NAD _83_
Did you use a GPS	unit to determine this UTM n	point? Y/N Y Precision of point (+/- metres) _4.2 m_
Dia you use a OI S	unii to determine inis 01111 p	out. 1714 1 Trecision of point (17 metes) _4.2 m_
Habitat: (Please in forms/use)	nclude dominant plants and id	lentify plant communities, a general description of area including land
		rops, occupied 80 % by Carex unilateralis. 20% open muddy ground
forms habitat for A	•	A avastis stalanifona Canar unilatenalis Chanhalium nalustus
		:: Agrostis stolonifera, Carex unilateralis, Gnaphalium palustre, othrys scouleri, Camassia quamash, Callitriche marginata.
T		Silver Control of the
Topographic featu	ures: Elevation:22 m_ ation was derived from GPS u	· · · · · · · · · · · · · · · · ·
(Flease note if elevi	ation was aerivea from GPS ui	nu)
Light:	Position:	Moisture:
X_ open	_X_ crest	_X_ inundated in winter/spring
X_ partial	upper slope	saturated (wet-mesic)
filtered	mid slope	moist (mesic)
shade	lower slope bottom	dry-mesic _X_ dry (xeric) in summer
D 14 D 4	bottom	
Population Data:		
		ount, if feasible; if plants are spreading vegetatively, indicate number
of aerial stems): _4		
Number of sub-pe	opulations & separation dis	stances (if applicable): One larger and one small patch, ca 3 m
apart		
		cres, please also indicate length & width with reference to cardinal
direction or landsc	ape feature, shape & how it r	relates any UTM's provided, ie the centrum): 2 sqm

in leaf	in bud	_X_in flower	n each category (or c immature fruit		
dormant	seedlin	gs			
Area for ske	etch:				
rired for six	cen.				
Landscape co	ontext (degre	e of fragmentatio	n and connectivity, s	pecies composition,	biological structure, ecologica
processes, an m away may l			ding area):Th	e only occurrence in	vicinity. Potential habitat ca. 50
iii away iiiay i	be too shaded				
Condition:	Condition is	an integrated made	asura of the quality of	f hiotic and abjotic	factors, structures and
					xistence of the occurrence.
Components	of condition j	for species are: 1)	reproduction and he	alth, 2) ecological	processes, 3) species
					to consider: evidence of regula s, the degree to which
					s, the degree to which son to other occurrences.)
Cond	ition apparen	tly good. No threa	its apparent. No serio	us competition by i	ntroduced plants.
Notes (land o	ownership, de	velopment plans, n	nanagement activities,	if any, other comme	ents): Fort Rodd Hill &
Fisgard Light	house Nationa	al Historic Site	Ţ.	•	
_					

Please return forms to: CDC, Ministry of Sustainable Resource Management, Terrestrial Information Branch, P.O. Box 9993 Station Provincial Government, Victoria BC V8W 9R7 (fax: 250-387-2733) **THANK YOU!**



B.C. Conservation Data Centre FIELD SURVEY FORM (PLANTS)

Note: Complete only for Red- or Blue-Listed species. Please fill out as many fields as you can, but precise locality and population data are especially important pieces of information.

Project name:
Fort Rodd
New/Update
Update EO #___

Address/ phone #/ Email: _1717 Woodsend Drive, Victoria, BC V9E 1H7 (250) 479-6470 hroemer@pacificcoast.net
Survey Date: (Month/Day/year):05 / 04 & 06 / 2002 1 st visit, or repeat visit to this site:1 st , 2nd
Location/Directions: (Please be as precise as possible; include photocopies of 1:20,000 trim or 1:50,000 topographic maps (if possible, but any maps are welcome)On slope below Upper Battery, Ft. Rodd
UTM grid reference: (from blue grid on 1:50,000 NTS map): (Please note what the North American Datum (NAD) designation is, found below the contour interval scale on NTS map, 27 or 83; a GPS unit can be set to either NAD designation; CDC Mapping uses NAD 83 data) ZONE (e.g. 10U) Lat 48° _25′ 55.1"_ Long 123° _27′ 17.4" NAD _83_ Did you use a GPS unit to determine this UTM point? Y / N Y Precision of point (+/- metres) _5.7m_
Habitat: (Please include dominant plants and identify plant communities, a general description of area including land forms/use)
Rocky, irregular to terraced S-facing slope with shallow soil cover, under light screen of young Garry oak. Dominant associates: Anthoxanthum odoratum, Elymus glaucus, Poa pratensis. Others: Quercus garryana, Mahonia aquifolium, Symphoricarpos albus, Cytisus scoparius seedlings, Daphne laureola, Lomatium utriculatum, Dactylis glomerata, Vicia sativa, Vicia hirsuta, Geranium molle, Sanicula crassicaulis, Claytonia perfoliata, Plantago lanceolata, Cerastium arvense, Galium aparine, Camassia leichtlinii, Stellaria media, Piperia transversa, Anthriscus caucalis, Bromus carinatus, Osmorhiza berteroi, Nemophila parviflora.
Topographic features: Elevation:20m metres feet (circle one) Slope:27% Aspect:S (Please note if elevation was derived from GPS unit)
Light: Position: Moisture: open crest inundated _X_ partial upper slope saturated (wet-mesic) filtered _X_ mid slope moist (mesic) shade lower slope _X_ dry-mesic bottom dry (xeric)
Population Data: Population Size: Estimated Number of Individuals (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems): 4 small to med.sized plants Number of sub-populations & separation distances (if applicable): 3 plants in one group, 1 plant 1.2m distant Area covered by population (m², ft², ha., or acres, please also indicate length & width with reference to cardinal direction or landscape feature, shape & how it relates any UTM's provided, ie the centrum):

Phenology: In	ndicate the nun	nber observed in	each category (or ch	neck if numbers are u	nknown):
		in flower	immature fruit	mature fruit	seed dispersing
dormant	seedlings				
Area for sket	tch:				
processes, and	abiotic factors		ng area):ther		ological structure, ecological ng about 0.5 m from nearest
processes <u>with</u> Components of composition an successful repr	in the occurred f condition for and biological s roduction, hab	<u>nce</u> , and the degi species are: 1) r tructure, 4) abio itat degradation,	ree to which they affor eproduction and hea tic physical/chemica disturbance, presen	alth, 2) ecological pro l factors. Factors to ce of exotic species, a	stence of the occurrence. ocesses, 3) species consider: evidence of regular
ecological pro	cesses are susi	aming me maon	ii. Where possible i	neillae a comparison	to other occurrences.
				ulation. Of a total of a state of	14 leaves, 12 have sustained
<u>Notes</u> (<i>land ov</i> Fisgard Lightho			magement activities, i	if any, other comments	s): Fort Rodd Hill &
_					

Please return forms to: CDC, Ministry of Sustainable Resource Management, Terrestrial Information Branch, P.O. Box 9993 Station Provincial Government, Victoria BC V8W 9R7 (fax: 250-387-2733) **THANK YOU!**



B.C. Conservation Data Centre FIELD SURVEY FORM (PLANTS)

Note: Complete only for Red- or Blue-Listed species. Please fill out as many fields as you can, but precise locality and population data are especially important pieces of information.

Project name:
Fort Rodd
New/Update
Update EO #____

Roemer Address/ pho	Callitriche marginata, site 8 Name of surveyor:Hans one #/ Email: _1717 Woodsend Drive, Victoria, BC V9E 1H7 (250) 479-6470
nroemer@pa	cificcoast.net
-	: (Month/Day/year):05 / 23 / 2002 1st visit, or repeat visit to this site:1st ed? _Xyesno Why?:monitoring
Specimen C	ollection # & Herbarium: (Please make a collection; in most cases, a collection is necessary to verify no collection, but compare Mike Miller survey Was a photo taken?Y_
maps (if pos	rections: (Please be as precise as possible; include photocopies of 1:20,000 trim or 1:50,000 topographic sible, but any maps are welcome)
(Please note	eference: (from blue grid on 1:50,000 NTS map): What the North American Datum (NAD) designation is, found below the contour interval scale on NTS 3; a GPS unit can be set to either NAD designation; CDC Mapping uses NAD 83 data)
	10U) Lat 48°25' 55.6" Long 123°27' 07.8" NAD _83_ a GPS unit to determine this UTM point? Y/N Y Precision of point (+/- metres) _4.2 m_
Habitat: (Pla forms/use)	ease include dominant plants and identify plant communities, a general description of area including land
forms habitat	10 m depression between rock outcrops, occupied 80 % by Carex unilateralis. 20% open muddy ground for Callitriche. ttered species in Callitriche habitat: Agrostis stolonifera, Carex unilateralis, Gnaphalium palustre, egrina, Myosurus minimus, Plagiobothrys scouleri, Camassia quamash, Alopecurus carolinianus.
_	
Topographic (Please note	e features: Elevation:22 m metres feet (circle one) Slope: Aspect: if elevation was derived from GPS unit)
Light:X_ openX_ parti: filtered shade	al upper slope saturated (wet-mesic)
	Data:
Area covere	sub-populations & separation distances (if applicable): 2 tiny patches d by population (m², ft², ha., or acres, please also indicate length & width with reference to cardinal andscape feature, shape & how it relates any UTM's provided, ie the centrum): 0.02 sqm

Phenology: I in leafdormant	ndicate the numbe in budseedlings		n each category _X_immature t				persing
	_						
Area for ske	tch:						
T and a an a a a				-:		hislasiaal s	
processes, and	d abiotic factors in more suitable habita	the surround					tructure, ecological anded by what
processes with Components of composition a successful rep	Condition is an inthe occurrence of condition for spendition for spend biological struction, habitate occesses are sustain	, and the deg ecies are: 1) i cture, 4) abio degradation	ree to which the reproduction of the physical/che, disturbance,	hey affect the and health, 2) hemical facto presence of e	continued ex ecological pers. Factors exotic species	xistence of the processes, 3) to consider: s, the degree	ne occurrence. species evidence of regular to which
No app	parent threats by c	ompeting pla	nts. Population	n very small.			
	wnership, developm ouse National Hist		anagement acti	ivities, if any,	other comme	nts):	_ Fort Rodd Hill &
_							

Please return forms to: CDC, Ministry of Sustainable Resource Management, Terrestrial Information Branch, P.O. Box 9993 Station Provincial Government, Victoria BC V8W 9R7 (fax: 250-387-2733) **THANK YOU!**



B.C. Conservation Data Centre FIELD SURVEY FORM (PLANTS)

Note: Complete only for Red- or Blue-Listed species. Please fill out as many fields as you can, but precise locality and population data are especially important pieces of information.

Project name:
Fort Rodd
New/Update
Update EO #___

	onia rubra ssp.depressa, site 5 #/ Email: _1717 Woodsend Drive, Vic	Name of surveyor:Hans Roemer etoria, BC V9E 1H7 (250) 479-6470
	coast.net_	
_		
	### Month/Day/year):05 / 06 / 2002 yesno Why?:	
	ction # & Herbarium: (Please make not collected	e a collection; in most cases, a collection is necessary to verify Was a photo taken?Y
	ions: (Please be as precise as possible, e, but any maps are welcome)	; include photocopies of 1:20,000 trim or 1:50,000 topographic
On W-facing	, low rock walls to the SW of Fisgard L	ight House
	(C. 11 .1 1.50.000 NTC	MAD GARDETII OOD IC
(Please note wh		MAP SHEET# _92B/6 designation is, found below the contour interval scale on NTS signation; CDC Mapping uses NAD 83 data)
		ong 123 °26' 53.0'' NAD _83_ Y / N Y Precision of point (+/- metres) _3.8 m_
Habitat: (Please forms/use)	include dominant plants and identify p	plant communities, a general description of area including land
Associated and a Grindelia integri	ralls in cracks of shore rocks, shaded duccidental species in immediate vicinity folia, Festuca rubra ssp., Montia fonta verna, Sonchus oleraceus, bryophytes.	(none dominant): una, Cerastium glomeratum, Poa annua, Stellaria media, Aira
	ntures: Elevation:6 m metres evation was derived from GPS unit)	feet (circle one)
Light: open _X_ partial filtered shade	Position: n.a crest upper slope mid slope lower slope bottom	Moisture: n.a inundated saturated (wet-mesic) moist (mesic) dry-mesic dry (xeric)
Population Data		
Population Size Estimated Num of aerial stems):	ber of Individuals (or exact count, if	f feasible; if plants are spreading vegetatively, indicate number
Number of sub-	populations & separation distances	
		ease also indicate length & width with reference to cardinal any UTM's provided, ie the centrum):
	1.5 sqm ?	

	seedlings	
Area for sketo	ch:	
	<u>text</u> (degree of fragmentation and connectivity, species composition abiotic factors in the surrounding area):	on, biological structure, ecological
so	me eutrophication by sea spray and bird dung possible	
processes withi Components of composition an successful repre	ondition is an integrated measure of the quality of biotic and abiot and the occurrence, and the degree to which they affect the continued condition for species are: 1) reproduction and health, 2) ecological biological structure, 4) abiotic physical/chemical factors. Facto oduction, habitat degradation, disturbance, presence of exotic speciesses are sustaining the habitat. Where possible include a compa	d existence of the occurrence. al processes, 3) species rs to consider: evidence of regula cies, the degree to which
Compai	ratively small population; some plants very small, but healthy and r	no obvious threats
	nership, development plans, management activities, if any, other comu use National Historic Site	ments): Fort Rodd Hill &

Please return forms to: CDC, Ministry of Sustainable Resource Management, Terrestrial Information Branch, P.O. Box 9993 Station Provincial Government, Victoria BC V8W 9R7 (fax: 250-387-2733) **THANK YOU!**



Note: Complete only for Red- or Blue-Listed species. Please fill out as many fields as you can, but precise locality and population data are especially important pieces of information.

Species:Claytonia rubra ssp. depressa, site 6 Name of surveyor:Hans Roemer Address/ phone #/ Email: _1717 Woodsend Drive, Victoria, BC V9E 1H7 (250) 479-6470 hroemer@pacificcoast.net
_
Survey Date: (Month/Day/year):05 / 06 / 2002 1 st visit, or repeat visit to this site:_1st Revisit needed?yesno Why?:
Specimen Collection # & Herbarium: (Please make a collection; in most cases, a collection is necessary to verification) HR02004 Was a photo taken?N
Location/Directions: (Please be as precise as possible; include photocopies of 1:20,000 trim or 1:50,000 topographic maps (if possible, but any maps are welcome)
Sw of Bennont Battery, Pt. Rodu
7777 A.
UTM grid reference: (from blue grid on 1:50,000 NTS map): (Please note what the North American Datum (NAD) designation is, found below the contour interval scale on NTS map, 27 or 83; a GPS unit can be set to either NAD designation; CDC Mapping uses NAD 83 data)
ZONE (e.g. 10U) Lat 48° 25' 50.5" Long 123° 27' 06.4" NAD _83 _
Habitat: (Please include dominant plants and identify plant communities, a general description of area including land forms/use)On the shaded side and in a deep crack of shoreline rock outcrop. Associated species (accidentals), widely scattered, no dominants, none competing with Claytonia: Poa annua, Armeria maritima, Cerastium glomeratum, Bromus rigidus, Hordeum murinum, Sagina decumbens
Topographic features: Elevation:4 m metres feet (circle one) Slope:100%+ AspectNNE
(Please note if elevation was derived from GPS unit)
Light: Position: n.a. Moisture: n.a.
_X open crest inundated saturated (wet-mesic)
partial upper stope saturated (wer-ineste) filtered mid slope moist (mesic)
shade lower slope dry-mesic
bottom dry (xeric)
Population Data:
<u>Population Size:</u> Estimated Number of Individuals (or exact count, if feasible; if plants are spreading vegetatively, indicate number
of aerial stems): _ca. 120 plants
Number of sub-populations & separation distances (if applicable):
Area covered by population (m², ft², ha., or acres, please also indicate length & width with reference to cardinal
direction or landscape feature, shape & how it relates any UTM's provided, ie the centrum): 2 sqm

in leaf				check if numbers are u uitmature fruit	
Area for ske	etch:				
					ological structure, ecological in by sea spray and bird dung?
processes with Components of composition of successful rep	hin the occurre of condition for and biological s production, hab	nce, and the deg species are: 1) t tructure, 4) abio itat degradation,	ree to which they a reproduction and h tic physical/chemic disturbance, prese	ealth, 2) ecological pro cal factors. Factors to ence of exotic species,	stence of the occurrence. ocesses, 3) species consider: evidence of regular
healt	hy population v	vithout obvious	threats		
	wnership, devel nouse National I		unagement activities	; if any, other comment.	s): Fort Rodd Hill &



Note: Complete only for Red- or Blue-Listed species. Please fill out as many fields as you can, but precise locality and population data are especially important pieces of information.

		Name of surveyor:Hans Roemer
Address/ phone a	#/ Email: _1717 Woodsend Drive, Vic	toria, BC V9E 1H7 (250) 479-6470
hroemer@pacific	coast.net_	
1		
_		
Survey Date: (M	/onth/Day/year):04 / 30 / 2002	1 st visit, or repeat visit to this site:1st
Revisit needed?	yesno Why?:	a collection; in most cases, a collection is necessary to verify
identification)	N	Was a photo taken?N
Location/Directi	ons: (Please be as precise as possible:	include photocopies of 1:20,000 trim or 1:50,000 topographic
To (J P control	,	
Vov Point	ca 650 m N of Fisgard Light House.	
1 CW 1 OIIIt,	ca 050 m tv of 1 isgard Eight House.	
UTM grid refere	ence: (from blue grid on 1:50,000 NTS	(map): MAP SHEET# _92B/6
(Please note who	at the North American Datum (NAD)	designation is, found below the contour interval scale on NTS
		rignation; CDC Mapping uses NAD 83 data)
_F , =, c, c, ,		To the state of th
70NF (e.g. 1011	I at 48° 26' 117" I a	ong 123 °26' 54.4'' NAD _83_
Dia you use a GF	S unit to determine this UTM point?	Y / N Precision of point (+/- metres)
		ck outcrop area. Immediate associate: Triteleia hyacinthina. olium perenne, Camassia leichtlinii, Cerastium glomeratum.
E	evation was derived from GPS unit)	metres feet (circle one) Slope:5% Aspect
(1 lease note if ete	valion was derived from G13 unit)	
Light:	Position:	Moisture:
X open	_X_ crest	_X_ inundated in winter & spring
partial	upper slope	saturated (wet-mesic)
filtered	mid slope	saturated (wet-mesic) moist (mesic)
shade	lower slope	dry-mesic
	bottom	_X_ dry (xeric) in summer
Population Data	:	
Population Size		
		feasible; if plants are spreading vegetatively, indicate number
,	15 plants	
	populations & separation distances	
Area covered by	population (m², ft², ha., or acres, ple	ease also indicate length & width with reference to cardinal
direction or lands	scape feature, shape & how it relates	any UTM's provided, ie the centrum): 0.2 sqm
	1	, , , , , , , , , , , , , , , , , , , ,

			n each category (or ch		
	in bud seedlings	in flower	immature fruit	mature fruit	seed dispersing
domant	seedings				
Area for sket	ch:				
		f fragmentation in the surround		ecies composition, l	piological structure, ecological
	no other l	nabitat in vicinit	у		
Condition: ((Condition is an	integrated mea	sure of the quality of	biotic and abiotic f	actors, structures and
processes with Components of composition ar successful repr	in the occurrent f condition for s and biological st anduction, habi	<u>ce</u> , and the deg species are: 1) ructure, 4) abio tat degradation	ree to which they affer reproduction and hea potic physical/chemical partition, disturbance, presend	ct the continued ex lth, 2) ecological po factors. Factors to ce of exotic species,	istence of the occurrence. rocesses, 3) species o consider: evidence of regular
		ulation limited			
5111	an nearing pop	anation minica	by matrice		
Notes (land ow Fisgard Lightho			anagement activities, i	f any, other commen	ts): Fort Rodd Hill &
_					



Note: Complete only for Red- or Blue-Listed species. Please fill out as many fields as you can, but precise locality and population data are especially important pieces of information.

Survey Date: (Month/Day/year):05 / 07 / 20021st visit, or repeat visit to this site:_repeat	_
Specimen Collection # & Herbarium: (Please make a collection; in most cases, a collection is necessary to ve identification) no collection Was a photo taken?Y Location/Directions: (Please be as precise as possible; include photocopies of 1:20,000 trim or 1:50,000 topograph maps (if possible, but any maps are welcome) NE of paved road, in former clearing, 500 m N from entrance to Ft. Rodd Hill Park UTM grid reference: (from blue grid on 1:50,000 NTS map):	
maps (if possible, but any maps are welcome)	Specimen Collecti
UTM grid reference: (from blue grid on 1:50,000 NTS map): (Please note what the North American Datum (NAD) designation is, found below the contour interval scale on N map, 27 or 83; a GPS unit can be set to either NAD designation; CDC Mapping uses NAD 83 data) ZONE (e.g. 10U) Lat 48°26' 25.8" Long 123°27' 12.2" NAD _83_ Did you use a GPS unit to determine this UTM point? Y / N	
(Please note what the North American Datum (NAD) designation is, found below the contour interval scale on Nap, 27 or 83; a GPS unit can be set to either NAD designation; CDC Mapping uses NAD 83 data) ZONE (e.g. 10U) Lat 48°26' 25.8"_ Long 123°27' 12.2" NAD _83_ Did you use a GPS unit to determine this UTM point? Y / N Y Precision of point (+/- metres) _6.3 m_ Habitat: (Please include dominant plants and identify plant communities, a general description of area including late forms/use) A flat area on shallow clay soil over bedrock that is wet in winter and spring, surrounded by young Douglas-firs. Dominant associates: Anthoxanthum odoratum, Agrostis stolonifera. Others: Scattered Cytisus scopario	NE of paved re
forms/use)A flat area on shallow clay soil over bedrock that is wet in winter and spring, surrounded by young Douglas-firs. Dominant associates: Anthoxanthum odoratum, Agrostis stolonifera. Others: Scattered Cytisus scopario	(Please note what map, 27 or 83; a G ZONE (e.g. 10U)
Topographic features: Elevation:40 m metres feet (circle one) Slope: _flat_ Aspect: (Please note if elevation was derived from GPS unit)	Douglas-firs. Domi
Light: Position: n.a. Moisture: _X_ open crest inundated partial upper slope _X_ saturated (wet-mesic) in winter/spring filtered mid slope moist (mesic) shade lower slope dry-mesic bottom _X_ dry (xeric) in summer	Douglas-firs. Domi Danthonia californ Topographic feature
Population Data: Population Size: Estimated Number of Individuals (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems): estimated 800 – 1000 plants	Douglas-firs. Domi Danthonia californ Topographic feature (Please note if elever Light: _X_ open partial filtered
Number of sub-populations & separation distances (if applicable): Area covered by population (m², ft², ha., or acres, please also indicate length & width with reference to cardinal direction or landscape feature, shape & how it relates any UTM's provided, ie the centrum): 300 sqm	Douglas-firs. Domi Danthonia californ Topographic feature (Please note if elevel) Light: _X_ open partial filtered shade Population Data: Population Size: Estimated Number

Phenology: I _x_ in leaf			in each catego immature				
dormant	seedlings	S					
Area for ske	etch:						
		of fragmentations in the surrou		ivity, specie	es composition	n, biological s	structure, ecological
distur	bed site; popul	ation probably	a remnant of a	former natur	ral occurrence.		
processes with Components composition a successful rep	hin the occurr of condition fo and biological production, ha	ence, and the d r species are: 1 structure, 4) al bitat degradatio	!) reproduction	they affect and health chemical fa e, presence	the continued , 2) ecological ctors. Factors of exotic speci	existence of the processes, 3 sto consider. es, the degree	the occurrence. b) species cevidence of regular e to which
associates. Du occurrence are now no direct	ue to the spring e unlikely to a competition,	g and winter we dvance into <i>Iso</i>	petes habitat. Iso rrounding grass	room and y oetes is rest	oung Douglas ricted to the w	-fir which surettest microh	rround the <i>Isoetes</i> abitats and there is
	wnership, deve nouse National		management ac	ctivities, if an	ny, other comm	nents):	_ Fort Rodd Hill &
_							



Note: Complete only for Red- or Blue-Listed species. Please fill out as many fields as you can, but precise locality and population data are especially important pieces of information.

_	anthes macounii, site 3 Nan	• —	
_	#/ Email: _1717 Woodsend Drive, Vicecoast.net_		
in oemer @ pacine	ccoast.net		
_			
Revisit needed?	######################################	- S	_
Specimen Collec	ction # & Herbarium: (Please make no collection; previously known occurred)	a collection; in most cases, a collec	ction is necessary to verify
	ions: (Please be as precise as possible, e, but any maps are welcome)Y		nouse,
(Please note who	ence: (from blue grid on 1:50,000 NTS nat the North American Datum (NAD) GPS unit can be set to either NAD des	designation is, found below the con-	
	Description of the Lat 48° 26' 10.8" Lower		
forms/use) mosaic fashion in	e include dominant plants and identify p On shoreline rock outcrops exposed a small draws and depressions between m, Lolium perenne. Others: Camassia landrinia ciliata.	I to ocean winds and eutrophication by shoreline rock outcrops. Dominant as	y birds and otters. In ssociates: <i>Poa annua</i> ,
	atures: Elevation:5 m revation was derived from GPS unit)	metres feet (circle one) Slope:0 -	-40%_ Aspect: _S to E
Light: _X_ open partial filtered shade	Position:X_ crest upper slope mid slope lower slope bottom	Moisture: inundated _X saturated (wet-mesic) in v moist (mesic) dry-mesic _X_ dry (xeric) in summer	winter, spring
Population Data	ı.		
Population Size:			
·	<u></u> a ber of Individuals (or exact count, if	feasible; if plants are spreading veg	etatively, indicate number
of aerial stems):	3,800 flowers on ca. 135 plants		
Number of sub-	-populations & separation distances	s (if applicable): 6 subpopulations,	average distance 2m
	y population (m², ft², ha., or acres, pl scape feature, shape & how it relates		

Phenology: Inc						re unknown):seed dispersion	าด
dormant _							8
Area for sketc	h:						
Landscape cont processes, and a					cies composition	n, biological structur	e, ecological
Eutrophicat vigorous_and at <i>Poa</i>)	ion by bird the same tir	droppings (Car ne threaten it t	nada geese, gu hrough extrei	ills) and otter mely lush gro	feces appears to wth of introduce	make this population d grasses (<i>Hordeum</i> ,	Lolium,
processes within Components of composition and successful repro	n the occuri condition fo d biological oduction, ha	<u>rence</u> , and the or species are: ! structure, 4) abitat degrada	degree to whe 1) reproduct abiotic physication, disturba	ich they affection and heal cal/chemical ince, presenc	ct the continued th, 2) ecological factors. Factor, e of exotic speci	c factors, structures existence of the occil processes, 3) species to consider: evidences, the degree to whison to other occurre	irrence. es ice of regular ich
Healthy	population	. Subsequent	visits reveale	d very abund	lant seed set.		
Notes (land own	nership, dev	elopment plan.	s, managemen	et activities, if	any, other comm	nents):	
Fort Ro	odd Hill & F	Fisgard Lightho	ouse National	Historic Site			
							_



Note: Complete only for Red- or Blue-Listed species. Please fill out as many fields as you can, but precise locality and population data are especially important pieces of information.

_	#/ Email: _1/1/ Woodsend Drive, V coast.net	ictoria, BC V9E 1H7 (250) 479-6470
_	- Coust.Het	
	onth/Day/year): _04/29/2002	
Revisit needed?	yesno Why?:	te a collection; in most cases, a collection is necessary to verif
	no collection	
		e; include photocopies of 1:20,000 trim or 1:50,000 topographic
		SW below Belmont Battery, Fort Rodd Hill Natl.
Historic Park		
I UTM and I was a way		MAD SHEET# 02D/C
(Please note who		TS map): MAP SHEET# _92B/6 D) designation is, found below the contour interval scale on NTS esignation; CDC Mapping uses NAD 83 data)
		ong 123 ° 27' 07.7"
forms/use)Don perenne, Medicag	ninants in immediate vicinity of Lim	e plant communities, a general description of area including land nanthes: Triteleia hyacinthina, Hordeum murinum, Lolium riegatum. Others: _Plectritis macrocera, Montia howellii, es arvensis, Hypochaeris radicata.
Topographic feat	tures: Elevation:5 m	metres feet (circle one) Slope: 5-20% Aspect
(Please note if ele	vation was derived from GPS unit) 1	V
Light: _X_ open partial filtered shade	Position: crest upper slope mid slope _X_ lower slope bottom	Moisture: inundated saturated (wet-mesic) _X moist (mesic) in spring only dry-mesic dry (xeric)
Donulation Data		
Population Data: Population Size:		
	ber of Individuals (or exact count,	if feasible; if plants are spreading vegetatively, indicate number
Number of sub-	populations & separation distance	es (if applicable): 3, separated by 1 m
		blease also indicate length & width with reference to cardinal
		s any UTM's provided, ie the centrum):
2 sqm	•	· · · · · · · · · · · · · · · · · · ·

Phenology: In in leaf	ndicate the number of in bud in f			check if numbe XX_mature f		spersing
	seedlings	10wei _7t_iii	innatare fruit	7474_mature 1	ruitseed di	spersing
Area for sket	ch:					
Landscape con processes, and	ntext (degree of frag abiotic factors in the	mentation and o	connectivity, s	pecies composi	tion, biological s	tructure, ecological
A	typical habitat of the s	species, but nativ	ve associates la	rgely replaced b	y aliens	
processes with Components of composition as successful rep	Condition is an integrin the occurrence, are f condition for speciend biological structured action, habitat decesses are sustaining	nd the degree to es are: 1) repro re, 4) abiotic pl gradation, disti	which they a duction and h hysical/chemic urbance, preso	ffect the contini ealth, 2) ecolog eal factors. Fac ence of exotic sp	ned existence of the control of the control of the consider: to consider: pecies, the degree	ne occurrence. species evidence of regular to which
Rather	small population thre	eatened to be or	verwhelmed b	y non-native pl	ants.	
	wnership, developmen tthouse National Histo		ment activities	, if any, other co	nments):	Fort Rodd Hill



Note: Complete only for Red- or Blue-Listed species. Please fill out as many fields as you can, but precise locality and population data are especially important pieces of information.

Revisit needed? _x_yesno W years Specimen Collection # & Herbar identification)not collect Location/Directions: (Please be as maps (if possible, but any maps areOn northern shoreline of Esquin UTM grid reference: (from blue gr (Please note what the North Amer map, 27 or 83; a GPS unit can be so ZONE (e.g. 10U) Lat 48	ium: (Please make a collection; in most cases, a collection is necessary to verify ed
Specimen Collection # & Herbar identification)not collect Location/Directions: (Please be as maps (if possible, but any maps areOn northern shoreline of Esquin UTM grid reference: (from blue gr (Please note what the North Amer map, 27 or 83; a GPS unit can be so ZONE (e.g. 10U) Lat 48	was a photo taken?N precise as possible; include photocopies of 1:20,000 trim or 1:50,000 topographic welcome) palt Lagoon, ca 350m NW of bridge across outlet and on 1:50,000 NTS map): MAP SHEET# _92B/6 pican Datum (NAD) designation is, found below the contour interval scale on NTS we to either NAD designation; CDC Mapping uses NAD 83 data)
maps (if possible, but any maps areOn northern shoreline of Esquin UTM grid reference: (from blue gr (Please note what the North Amer map, 27 or 83; a GPS unit can be so ZONE (e.g. 10U) Lat 48	nalt Lagoon, ca 350m NW of bridge across outlet id on 1:50,000 NTS map): map SHEET# _92B/6 ican Datum (NAD) designation is, found below the contour interval scale on NTS et to either NAD designation; CDC Mapping uses NAD 83 data)
UTM grid reference: (from blue gr (Please note what the North Amer map, 27 or 83; a GPS unit can be so ZONE (e.g. 10U) Lat 48	rid on 1:50,000 NTS map): MAP SHEET# _92B/6 ican Datum (NAD) designation is, found below the contour interval scale on NTS et to either NAD designation; CDC Mapping uses NAD 83 data)
(Please note what the North Amer map, 27 or 83; a GPS unit can be so ZONE (e.g. 10U) Lat 48	ican Datum (NAD) designation is, found below the contour interval scale on NTS et to either NAD designation; CDC Mapping uses NAD 83 data)
ZONE (e.g. 10U) Lat 48 Did you use a GPS unit to determin	
	o _25' 56.3" Long 123 o _27' 39.1" NAD _83_ e this UTM point? Y / N Y Precision of point (+/- metres) _8.3 m_
forms/use)In short turf of annu	plants and identify plant communities, a general description of area including land hal herbs and grasses on S-facing slope exposed to ocean winds. Dominant ohanes arvensis, Aira praecox. Others: Trifolium dubium, Trifolium microcephalum,
Topographic features: Elevation (Please note if elevation was derived)	on:5 m metres feet (circle one) Slope:35% Aspect: _SSE
Light: Position:X open	eX_ moist (mesic) in spring pe dry-mesic
Population Data: Population Size: Estimated Number of Individual of aerial stems): Only or	s (or exact count, if feasible; if plants are spreading vegetatively, indicate number to plant seen Number of sub-
	ces (if applicable): ft², ha., or acres, please also indicate length & width with reference to cardinal be & how it relates any UTM's provided, ie the centrum):

			each category (or che immature fruit		
dormant	seedling				
		,			
Area for ske	tch:				
	l abiotic facto	ors in the surround			oiological structure, ecological areas sloping to the shoreline,
					
processes with Components of composition a successful rep	nin the occur of condition f ond biologica roduction, h	rence, and the deg or species are: 1) i l structure, 4) abio abitat degradation,	reproduction and heal tic physical/chemical , disturbance, presenc	ct the continued exi th, 2) ecological pr factors. Factors to e of exotic species,	istence of the occurrence. rocesses, 3) species o consider: evidence of regula
enecies	combinatio	n of community si	milar to that of other 7	Trifolium denguner	atum sites; number of
-		bvious disturbance		пјонит аераирет	dium sites, number of
introductions .	sililiar, no o	Trious disturbance			
<u>Notes</u> (<i>land o</i> r Fisgard Lighth			anagement activities, if	any, other commen	ts): Fort Rodd Hill &
_					



Note: Complete only for Red- or Blue-Listed species. Please fill out as many fields as you can, but precise locality and population data are especially important pieces of information.

Roemer	epauperatum, sites 2 and 4	Name of surveyor:Hans	
		ctoria, BC V9E 1H7 (250) 479-6470	
hroemer@pacificcoas	.net		
Revisit needed?	/Day/year): _04/26/2002 yesno Why?:	_	visit to this site:_ ?_
Specimen Collection	# & Herbarium: (Please make no collection_	e a collection; in most cases, a colle	
		r; include photocopies of 1:20,000 tri Yew Point, 650 m N of Fisgard Lightl	
UTM grid reference:	(from blue grid on 1:50,000 NT)	S map):	MAP SHEET# _92B/6
) designation is, found below the consignation; CDC Mapping uses NAD	
		Long 123 ° 26' 54.5"_to 27' 09.4 Y/N Y Precision of point (+,	
forms/use)On a low outcropsShallow so Dominants: Triteleia i Triphysaria pusilla, S utriculatum, Cerastium	w bench (main population) and o l, highly exposed to ocean winds hyacinthina, Trifolium variegatur, ilene gallica, Plantago elongata, m glomeratum, Geranium molle,	plant communities, a general descrip n animal trail paralllelling shoreline a s. Vegetation is short turf of the follow n, Trifolium depauperatum. Others: T Aphanes arvensis, Erodo\ium cicutan Cynosurus echinatus, Medicago arab rvensis, Vicia lathyroides, Bromus ho	and bordered by rock ving rifolium willdenowii, rium, Lomatium vica, Vicia hirsuta, Armeria
	s: Elevation: _4 - 7 m on was derived from GPS unit)	metres feet (circle one) Slope:	_30% Aspect: _SSE
open open partial filtered	Position: crest upper slope mid slope _X_ lower slope bottom	Moisture: inundated saturated (wet-mesic) _X_ moist (mesic) in spring dry-mesic _X_ dry (xeric) in summmer	
Population Data:		• ' '	
Population Size: Estimated Number	of Individuals (or exact count. i	f feasible; if plants are spreading ve	getatively, indicate number
of aerial stems): ca.	60 plants in site 4, plus 110 plan	nts in site 2, including trail between 2	2 and 4.
Area covered by pop	oulation (m², ft², ha., or acres, p	s (if applicable): small subpop's structure lease also indicate length & width wany UTM's provided, ie the centrum	ith reference to cardinal

			each category (or chimmature fruit		unknown):seed dispersing
Area for sket	ch:				
		of fragmentation in the surround		ecies composition,	biological structure, ecological
Species has take	en advantage o	herbaceous/grass f similar linear ha	bitat along an animal	high wind exposure trail connecting the	and shallow soil) is restricted. two subpopulations (sites 2 and
					actors, structures and
Components of composition an successful repr	condition for d biological s oduction, hab	species are: 1) r tructure, 4) abio itat degradation,	eproduction and hea tic physical/chemica disturbance, presen	olth, 2) ecological p l factors. Factors t ce of exotic species	istence of the occurrence. rocesses, 3) species o consider: evidence of regular , the degree to which on to other occurrences.)
Small to	o medium-size	populations, ap	parently healthy.		
Notes (land ow	vnership, devel	opment plans, ma	ınagement activities, į	f any, other commer	uts):
Fort	Rodd Hill & F	isgard Lighthouse	National Historic Sit	e	