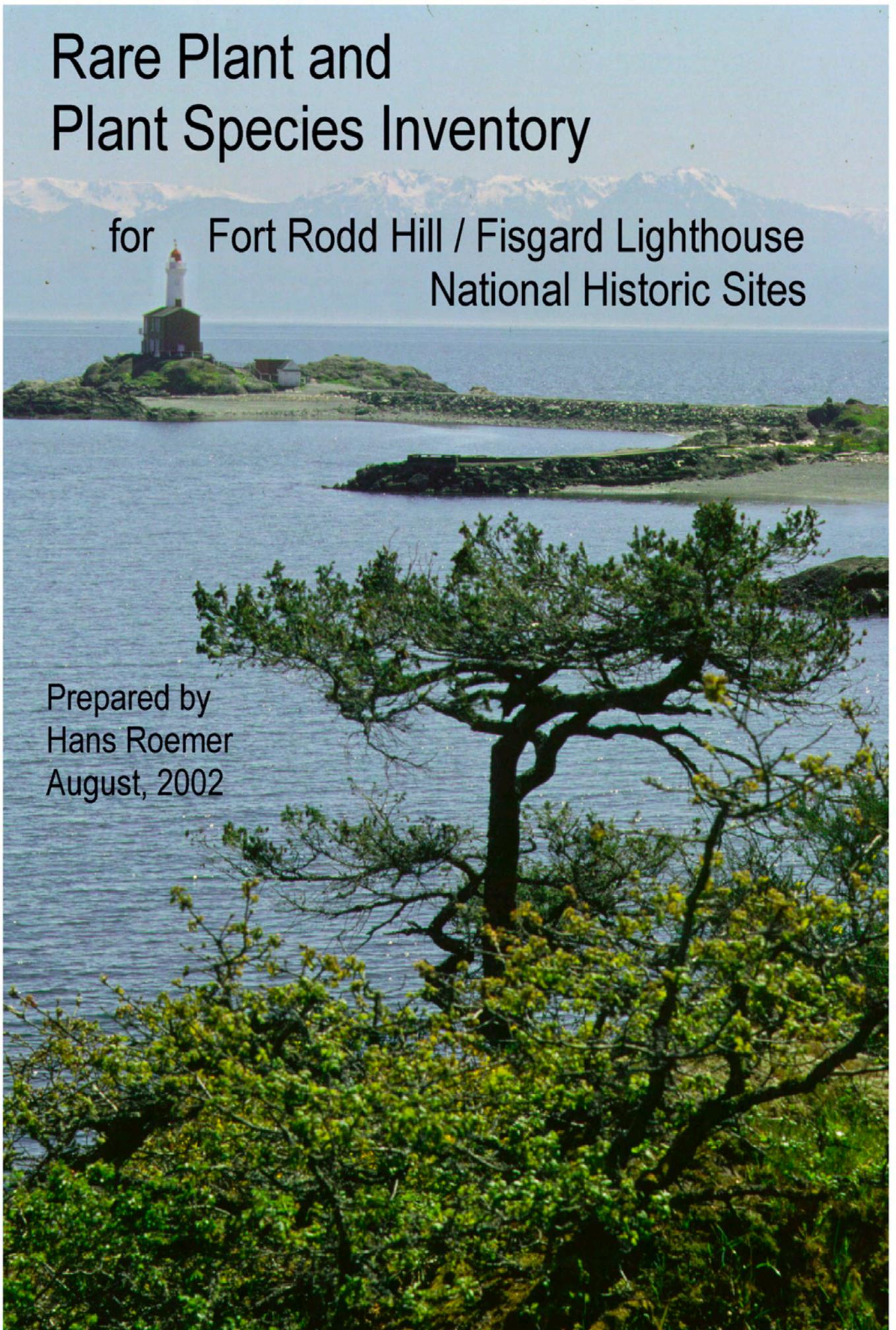


Rare Plant and Plant Species Inventory

for Fort Rodd Hill / Fisgard Lighthouse
National Historic Sites

Prepared by
Hans Roemer
August, 2002



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

Prepared by **Hans Roemer**
for Parks Canada
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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.

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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 # (site location on Fig.1)	BC CDC status	COSEWIC status	Number of plants	Special habitat	Main risk to population (if any)
<i>Balsamorhiza deltoidea</i> (deltoid balsamroot), site 10	RED G5 S1	endangered	4	Garry oak woodland	Ecosystem degradation through introduced plants and animals?
<i>Callitriche marginata</i> (winged water-starwort), site 8/9	RED G4 S1	-	(patch of 200 cm ²)	Stagnant ephemeral pool	Human modification of habitat
<i>Alopecurus carolinianus</i> (Carolina meadow-foxtail), site 8/9	RED G5 S2	-	48	Stagnant ephemeral pool	“
<i>Claytonia rubra</i> ssp. <i>depressa</i> (red-stem spring beauty), site 5	RED G5T? S2	-	14	Shoreline rock walls	-
<i>Claytonia rubra</i> ssp. <i>depressa</i> (red-stem spring beauty), site 6	“	-	120	“	-
<i>Limnanthes macounii</i> (Macoun's meadow-foam), site 3	BLUE G3 S3	vulnerable	135	Shoreline vernal pool and seepage site	Competition by introduced grasses
<i>Limnanthes macounii</i> (Macoun's meadow-foam), site 7	“	vulnerable	25	“	“
<i>Isotes nuttallii</i> (Nuttall's quillwort), site 1	BLUE G4? S3	-	15	Shoreline vernal pool hollow	Possible risk through vigorous growth of introduced grasses
<i>Isotes nuttallii</i> (Nuttall's quillwort), site 12	“	-	800-1000	Inland vernal pool, possibly an artificial site	Possible expansion of <i>Agrostis stolonifera</i> into <i>Isotes</i> habitat
<i>Trifolium depauperatum</i> (poverty clover), site 2	BLUE G5 S2	-	110	Shallow soils supporting only short turf of annuals	Invasion by taller plants, mainly introduced species.
<i>Trifolium depauperatum</i> (poverty clover), site 4	“	-	60	“	“
<i>Trifolium depauperatum</i> (poverty clover), site 11	“	-	1	“	“

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

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

<i>Clinopodium douglasii</i>	Lamiaceae	O		R	F	yerba buena
<i>Collinsia grandiflora</i> var. <i>pusilla</i>	Scrophulariaceae	C		R	F	blue-eyed Mary
<i>Conioselinum gmelinii</i>	Apiaceae	O		R		Pacific hemlock-parsley
<i>Convolvulus arvensis</i>	Convolvulaceae	O	A		F	field bindweed
<i>Corallorhiza maculata</i>	Orchidaceae	O		R	F	spotted coralroot
<i>Cornus nuttallii</i>	Cornaceae	O		R	F	western flowering dogwood
<i>Cornus stolonifera</i>	Cornaceae	O		R		red-osier dogwood
<i>Cotoneaster</i> sp.	Rosaceae	O	A	R	F	cotoneaster
<i>Crataegus douglasii</i>	Rosaceae	C		R	F	black hawthorn
<i>Crataegus monogyna</i>	Rosaceae	O	A		F	common hawthorn
<i>Crepis capillaris</i>	Asteraceae	O	A	R		smooth hawksbeard
<i>Cynosurus cristatus</i>	Poaceae	O	A	R		crested dogtail
<i>Cynosurus echinatus</i>	Poaceae	C	A	R	F	hedgehog dogtail
<i>Cytisus scoparius</i>	Fabaceae	V	A	R	F	Scotch broom
<i>Dactylis glomerata</i>	Poaceae	V	A	R	F	orchard-grass
<i>Danthonia californica</i>	Poaceae	O		R	F	California oatgrass
<i>Daphne laureola</i>	Thymeleaceae	V	A	R	F	spurge-laurel
<i>Daucus carota</i>	Apiaceae	O	A	R	F	wild carrot
<i>Delphinium menziesii</i>	Ranunculaceae	O		R		Menzies' larkspur
<i>Deschampsia elongata</i>	Poaceae	R			F	slender hairgrass
<i>Digitalis purpurea</i>	Scrophulariaceae	O	A	R	F	common foxglove
<i>Distichlis spicata</i> var. <i>spicata</i>	Poaceae	O		R	F	seashore saltgrass
<i>Dodecatheon hendersonii</i>	Primulaceae	C		R	F	broad-leaved shootingstar
<i>Draba verna</i>	Brassicaceae	O	A	R		common whitlow grass
<i>Elymus glaucus</i>	Poaceae	C		R	F	blue wildrye
<i>Elymus repens</i>	Poaceae	O	A	R	F	quackgrass
<i>Epilobium brachycarpum</i>	Onagraceae	O		R		tall annual willow-herb
<i>Epilobium ciliatum</i> ssp. <i>ciliatum</i>	Onagraceae	?			F	purple-leaved willowherb
<i>Epipactis helleborine</i>	Orchidaceae	O	A		F	helleborine
<i>Equisetum arvense</i>	Equisetaceae	O		R		common horsetail
<i>Equisetum telmateia</i>	Equisetaceae	O		R		giant horsetail
<i>Erica</i> cf. <i>australis</i>	Ericaceae	R	A	R		Spanish tree heather
<i>Eriophyllum lanatum</i>	Asteraceae	O			F	woolly eriophyllum
<i>Erodium cicutarium</i>	Geraniaceae	C	A	R	F	common stork's-bill
<i>Erythronium oregonum</i>	Liliaceae	O		R	F	white fawn lily
<i>Fagus sylvatica</i>	Fagaceae	R	A	R		European beech
<i>Festuca occidentalis</i>	Poaceae	O		R	F	western fescue
<i>Festuca rubra</i>	Poaceae	O	A	R	F	red fescue
<i>Festuca rubra</i> ssp. <i>arenicola</i>	Poaceae	O		R		native red fescue
<i>Festuca subuliflora</i>	Poaceae	O		R		crinkle-awn fescue
<i>Fragaria vesca</i>	Rosaceae	O		R	F	wood strawberry
<i>Fritillaria affinis</i>	Liliaceae	O		R	F	chocolate lily
<i>Galium aparine</i>	Rubiaceae	C	A	R	F	cleavers

<i>Galium triflorum</i>	Rubiaceae	C		R	F	sweet-scented bedstraw
<i>Gaultheria shallon</i>	Ericaceae	C		R	F	salal
<i>Geranium dissectum</i>	Geraniaceae	O	A	R	F	cut-leaved geranium
<i>Geranium molle</i>	Geraniaceae	C	A	R	F	dovefoot geranium
<i>Geranium pusillum</i>	Geraniaceae	?	A		F	small-flowered geranium
<i>Geranium robertianum</i>	Geraniaceae	C	A	R	F	herb-Robert
<i>Geum macrophyllum</i>	Rosaceae	O		R	F	large-leaved avens
<i>Glaux maritima</i>	Primulaceae	O		R	F	sea-milkwort
<i>Gnaphalium palustre</i>	Asteraceae	R		R		lowland cudweed
<i>Goodyera oblongifolia</i>	Orchidaceae	O		R	F	rattlesnake-plantain
<i>Gratiola ebracteata</i>	Scrophulariaceae	R		R	F	bract-less hedge-hyssop
<i>Grindelia integrifolia</i>	Asteraceae	C		R	F	Puget Sound gumweed
<i>Hedera helix</i>	Araliaceae	O	A	R	F	English ivy
<i>Heuchera micrantha</i>	Saxifragaceae	O		R	F	small-flowered alumroot
<i>Hieracium albiflorum</i>	Asteraceae	O		R	F	white hawkweed
<i>Holcus lanatus</i>	Poaceae	C	A	R	F	common velvet-grass
<i>Holodiscus discolor</i>	Rosaceae	C		R	F	oceanspray
<i>Hordeum brachyantherum</i>	Poaceae	O		R	F	meadow barley
<i>Hordeum murinum</i> ssp. <i>murinum</i>	Poaceae	C	A	R		mouse barley
<i>Hyacinthoides non-scripta</i>	Liliaceae	O	A	R		English bluebell
<i>Hypericum calycinum</i>	Clusiaceae	O	A	R		St.John's wort
<i>Hypericum olympicum</i>	Clusiaceae	R	A	R		St.John's wort
<i>Hypochaeris radicata</i>	Asteraceae	C	A	R	F	hairy cat's-ear
<i>Ilex aquifolium</i>	Aquifoliaceae	C	A	R	F	English holly
<i>Isoetes nutallii</i>	Isoetaceae	O		R		Nuttall's quillwort
<i>Juncus balticus</i>	Juncaceae	O		R		Baltic rush
<i>Juncus bufonius</i>	Juncaceae	O		R		toad rush
<i>Juncus effusus</i>	Juncaceae	O	A	R		common rush
<i>Juncus ensifolius</i>	Juncaceae	O		R		dagger-leaf rush
<i>Juncus gerardii</i>	Juncaceae	O		R	F	Gerard's rush
<i>Kolkwitzia amabilis</i>	Caprifoliaceae	R	A	R		beauty bush
<i>Laburnum anagyroides</i>	Fagaceae	O	A	R		laburnum
<i>Lactuca muralis</i>	Asteraceae	C	A	R	F	wall-lettuce
<i>Lamium purpureum</i>	Lamiaceae	C	A	R	F	purple dead-nettle
<i>Lapsana communis</i>	Asteraceae	C	A	R		nipplewort
<i>Lathyrus japonicus</i>	Fabaceae	O		R	F	beach pea
<i>Lathyrus nevadensis</i>	Fabaceae	O		R	F	purple peavine
<i>Leontodon taraxacoides</i>	Asteraceae	C	A	R	F	hairy hawkbit
<i>Lepidium heterophyllum</i>	Brassicaceae	O	A	R		Smith's pepper-grass
<i>Leucanthemum vulgare</i>	Asteraceae	O	A	R	F	oxeye daisy
<i>Leymus mollis</i>	Poaceae	C		R	F	dune wildrye
<i>Lilium columbianum</i>	Liliaceae	O		R		Columbia lily
<i>Limnanthes macounii</i>	Limnathaceae	R		R	F	Macoun's meadow-foam

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

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

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

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

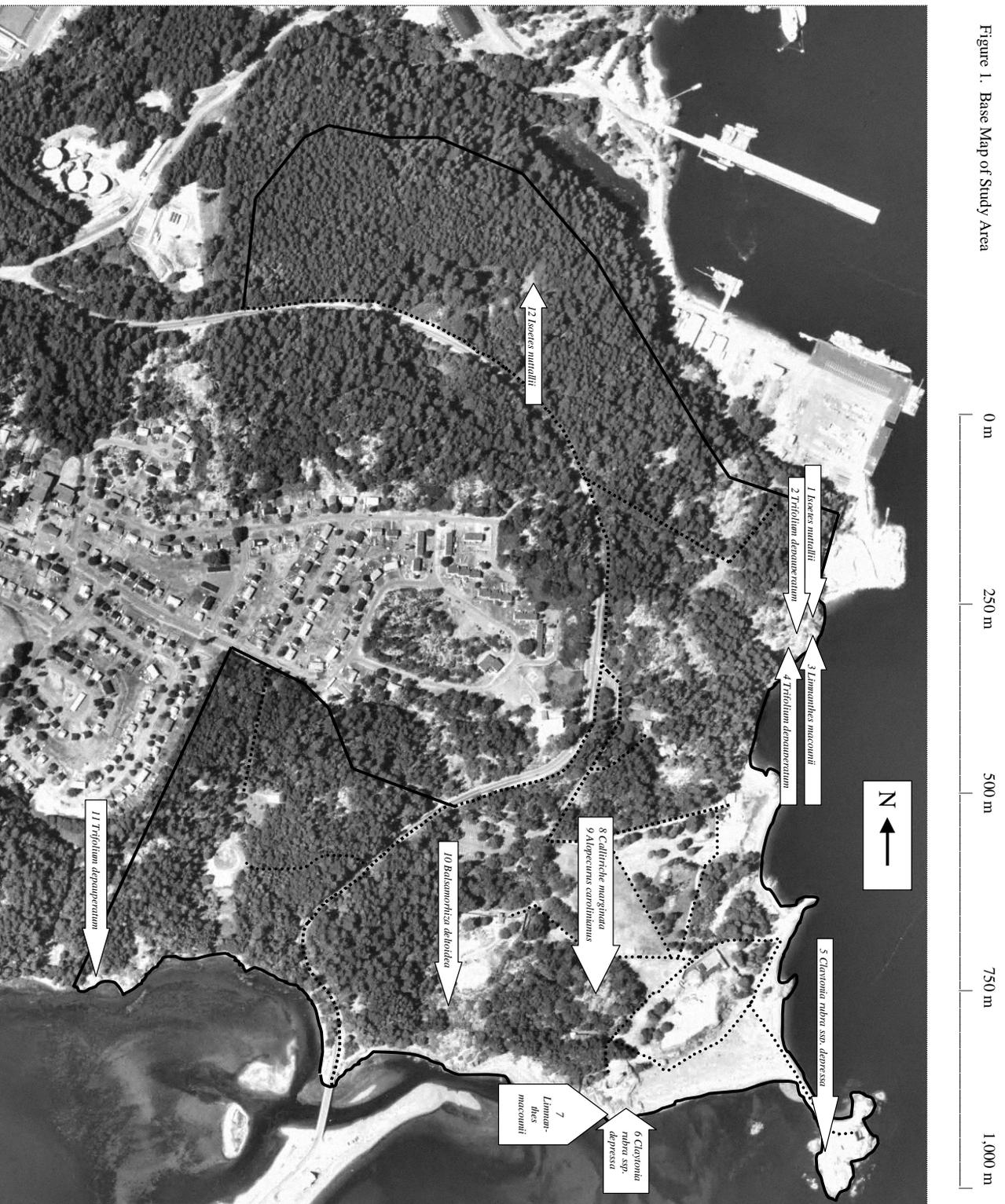
References

- Aruncus Consulting. 2002. Vegetation of Fort Rodd Hill / Fisgard Lighthouse National Historic Sites. Report prepared for Parks Canada Agency, Victoria, BC.
- Blight, Louise, Capital Regional District Parks. 2002. Personal communication on CRD staff having observed deer browsing damage on *Balsamorhiza deltoidea* leaves.
- 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



scale 1:5,000 (orthorectified)

Figure 1
Location of Rare Plants
In Fort Rodd Hill /
Fisgard Lighthouse
National Historic Sites



Limnanthes macounii, flowers and immature fruit



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



Dense stand of *Isoetes nuttallii* in site 12



Low carpet of *Trifolium depauperatum* in site 2. (Umbels of yellow *Lomatium utriculatum* are about 5 cm across.)



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.



Claytonia rubra ssp. *depressa* in a west-facing rock wall (site 6, near Figsard Lighthouse)



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 #___
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Species: Alopecurus carolinianus, site 9 _____ **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): 06 / 10 / 2002 **1st visit, or repeat visit to this site:** 1st
Revisit needed? yes no Why?: monitoring advised

Specimen Collection # & Herbarium: (Please make a collection; in most cases, a collection is necessary to verify identification) HR02027 **Was a photo taken?** Y

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) _____
400 m WNW of Fisgard Light House. A raised rock outcrop area with central depression to the S of the "Battery Commander's Post".

UTM grid reference: (from blue grid on 1:50,000 NTS map): _____ **MAP SHEET#** 92B/6
(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' 55.6" **Long** 123° 27' 07.8" **NAD** 83
Did you use a GPS unit to determine this UTM point? Y / N Y Precision of point (+/- metres) 4.2 m

Habitat: (Please include dominant plants and identify plant communities, a general description of area including land forms/use)

A 3.5 x 10 m depression between rock outcrops, occupied 80 % by Carex unilateralis. 20% open muddy ground forms habitat for Alopecurus.

Scattered species in Alopecurus habitat: Agrostis stolonifera, Carex unilateralis, Gnaphalium palustre, Veronica peregrina, Myosurus minimus, Plagiobothrys scouleri, Camassia quamash, Callitriche marginata.

Topographic features: **Elevation:** 22 m metres feet (circle one) **Slope:** _____ **Aspect:** _____
(Please note if elevation was derived from GPS unit)

Light:	Position:	Moisture:
<input checked="" type="checkbox"/> open	<input checked="" type="checkbox"/> crest	<input checked="" type="checkbox"/> inundated in winter/spring
<input checked="" type="checkbox"/> partial	<input type="checkbox"/> upper slope	<input type="checkbox"/> saturated (wet-mesic)
<input type="checkbox"/> filtered	<input type="checkbox"/> mid slope	<input type="checkbox"/> moist (mesic)
<input type="checkbox"/> shade	<input type="checkbox"/> lower slope	<input type="checkbox"/> dry-mesic
	<input type="checkbox"/> bottom	<input checked="" type="checkbox"/> dry (xeric) in summer

Population Data:

Population Size:
Estimated Number of Individuals (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems): 48 plants

Number of sub-populations & separation distances (if applicable): One larger and one small patch, ca 3 m apart

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

Phenology: Indicate the number observed in each category (or check if numbers are unknown):

___ in leaf ___ in bud X in flower ___ immature fruit ___ mature fruit ___ seed dispersing
___ dormant ___ seedlings

Area for sketch:

Landscape context (degree of fragmentation and connectivity, species composition, biological structure, ecological processes, and abiotic factors in the surrounding area): _____ The only occurrence in vicinity. Potential habitat ca. 50 m away may be too shaded

Condition: (*Condition is an integrated measure of the quality of biotic and abiotic factors, structures and processes within the occurrence, and the degree to which they affect the continued existence of the occurrence. Components of condition for species are: 1) reproduction and health, 2) ecological processes, 3) species composition and biological structure, 4) abiotic physical/chemical factors. Factors to consider: evidence of regular successful reproduction, habitat degradation, disturbance, presence of exotic species, the degree to which ecological processes are sustaining the habitat. Where possible include a comparison to other occurrences.*)

_____ Condition apparently good. No threats apparent. No serious competition by introduced plants.

Notes (*land ownership, development plans, management activities, if any, other comments*): _____ Fort Rodd Hill & Fisgard Lighthouse National Historic Site

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 #___

Species: Balsamorhiza deltoidea, site 10 **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 / 04 & 06 / 2002 **1st visit, or repeat visit to this site:** 1st, 2nd
Revisit needed? Yes no Why?: must be monitored; remnant of once flowering population, in decline

Specimen Collection # & Herbarium: (Please make a collection; in most cases, a collection is necessary to verify identification) Not collected **Was a photo taken?** Y

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): **MAP SHEET#** 92B/6
 (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:
<input type="checkbox"/> open	<input type="checkbox"/> crest	<input type="checkbox"/> inundated
<input checked="" type="checkbox"/> partial	<input type="checkbox"/> upper slope	<input type="checkbox"/> saturated (wet-mesic)
<input type="checkbox"/> filtered	<input checked="" type="checkbox"/> mid slope	<input type="checkbox"/> moist (mesic)
<input type="checkbox"/> shade	<input type="checkbox"/> lower slope	<input checked="" type="checkbox"/> dry-mesic
	<input type="checkbox"/> bottom	<input type="checkbox"/> 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: Indicate the number observed in each category (or check if numbers are unknown):

in leaf in bud in flower immature fruit mature fruit seed dispersing
 dormant seedlings

Area for sketch:

Landscape context (degree of fragmentation and connectivity, species composition, biological structure, ecological processes, and abiotic factors in the surrounding area): _____ there is an otter trail passing about 0.5 m from nearest plant; adjacent *Symphoricarpos* and *Cytisus* browsed by deer.

Condition: (*Condition is an integrated measure of the quality of biotic and abiotic factors, structures and processes within the occurrence, and the degree to which they affect the continued existence of the occurrence. Components of condition for species are: 1) reproduction and health, 2) ecological processes, 3) species composition and biological structure, 4) abiotic physical/chemical factors. Factors to consider: evidence of regular successful reproduction, habitat degradation, disturbance, presence of exotic species, the degree to which ecological processes are sustaining the habitat. Where possible include a comparison to other occurrences.*)

_____ A non-flowering remnant of a once thriving (flowering) population. Of a total of 14 leaves, 12 have sustained damage in their early stages of growth, possibly by slugs or through vertebrate grazing.

Notes (*land ownership, development plans, management activities, if any, other comments*): _____ Fort Rodd Hill & Fisgard Lighthouse National Historic Site

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 #___
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Species: Callitriche marginata, site 8 _____ **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 / 23 / 2002 **1st visit, or repeat visit to this site:** 1st
Revisit needed? yes no Why?: monitoring advised

Specimen Collection # & Herbarium: (Please make a collection; in most cases, a collection is necessary to verify identification) no collection, but compare Mike Miller survey **Was a photo taken?** Y

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) _____
400 m WNW of Fisgard Light House. A raised rock outcrop area with central depression to the S of the "Battery Commander's Post".

UTM grid reference: (from blue grid on 1:50,000 NTS map): _____ **MAP SHEET#** 92B/6
(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' 55.6" **Long** 123° 27' 07.8" **NAD** 83
Did you use a GPS unit to determine this UTM point? Y / N Y Precision of point (+/- metres) 4.2 m

Habitat: (Please include dominant plants and identify plant communities, a general description of area including land forms/use)

A 3.5 x 10 m depression between rock outcrops, occupied 80 % by Carex unilateralis. 20% open muddy ground forms habitat for Callitriche.
Scattered species in Callitriche habitat: Agrostis stolonifera, Carex unilateralis, Gnaphalium palustre, Veronica peregrina, Myosurus minimus, Plagiobothrys scouleri, Camassia quamash, Alopecurus carolinianus.

Topographic features: **Elevation:** 22 m metres feet (circle one) **Slope:** _____ **Aspect:** _____
(Please note if elevation was derived from GPS unit)

Light:	Position:	Moisture:
<input checked="" type="checkbox"/> open	<input checked="" type="checkbox"/> crest	<input checked="" type="checkbox"/> inundated in winter/spring
<input checked="" type="checkbox"/> partial	<input type="checkbox"/> upper slope	<input type="checkbox"/> saturated (wet-mesic)
<input type="checkbox"/> filtered	<input type="checkbox"/> mid slope	<input type="checkbox"/> moist (mesic)
<input type="checkbox"/> shade	<input type="checkbox"/> lower slope	<input type="checkbox"/> dry-mesic
	<input type="checkbox"/> bottom	<input checked="" type="checkbox"/> dry (xeric) in summer

Population Data:

Population Size:
Estimated Number of Individuals (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems): A tiny mat of plants. Number not possible to determine without disturbing plant(s?)

Number of sub-populations & separation distances (if applicable): 2 tiny patches
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): 0.02 sqm

Phenology: Indicate the number observed in each category (or check if numbers are unknown):

___ in leaf ___ in bud ___ in flower X immature fruit ___ mature fruit ___ seed dispersing
___ dormant ___ seedlings

Area for sketch:

Landscape context (degree of fragmentation and connectivity, species composition, biological structure, ecological processes, and abiotic factors in the surrounding area): _____ Two tiny patches of the plant surrounded by what appears to be more suitable habitat

Condition: (*Condition is an integrated measure of the quality of biotic and abiotic factors, structures and processes within the occurrence, and the degree to which they affect the continued existence of the occurrence. Components of condition for species are: 1) reproduction and health, 2) ecological processes, 3) species composition and biological structure, 4) abiotic physical/chemical factors. Factors to consider: evidence of regular successful reproduction, habitat degradation, disturbance, presence of exotic species, the degree to which ecological processes are sustaining the habitat. Where possible include a comparison to other occurrences.*)

_____ No apparent threats by competing plants. Population very small.

Notes (*land ownership, development plans, management activities, if any, other comments*): _____ Fort Rodd Hill & Fisgard Lighthouse National Historic Site

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 #___
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Species: Claytonia rubra ssp. depressa, site 5 **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 **1st visit, or repeat visit to this site:** 1st

Revisit needed? yes no Why?: _____

Specimen Collection # & Herbarium: (Please make a collection; in most cases, a collection is necessary to verify identification) not collected **Was a photo taken?** Y

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 W-facing, low rock walls to the SW of Fisgard Light House

UTM grid reference: (from blue grid on 1:50,000 NTS map): **MAP SHEET#** 92B/6
 (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' 48.8" **Long** 123° 26' 53.0" **NAD** 83
 Did you use a GPS unit to determine this UTM point? Y / N Y Precision of point (+/- metres) 3.8 m

Habitat: (Please include dominant plants and identify plant communities, a general description of area including land forms/use)

On vertical walls in cracks of shore rocks, shaded during part of the day.

Associated and accidental species in immediate vicinity (none dominant):

Grindelia integrifolia, Festuca rubra ssp., Montia fontana, Cerastium glomeratum, Poa annua, Stellaria media, Aira praecox, Draba verna, Sonchus oleraceus, bryophytes.

Topographic features: **Elevation:** 6 m metres feet (circle one) **Slope:** 80-100+ % **Aspect:** WNW
 (Please note if elevation was derived from GPS unit)

Light:	Position: n.a.	Moisture: n.a.
<u>open</u>	<u>crest</u>	<u>inundated</u>
<u>X</u> partial	<u>upper slope</u>	<u>saturated (wet-mesic)</u>
<u>filtered</u>	<u>mid slope</u>	<u>moist (mesic)</u>
<u>shade</u>	<u>lower slope</u>	<u>dry-mesic</u>
	<u>bottom</u>	<u>dry (xeric)</u>

Population Data:

Population Size:

Estimated Number of Individuals (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems): 14 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): _____

1.5 sqm ?

Phenology: Indicate the number observed in each category (or check if numbers are unknown):

___ in leaf _4_ in bud _10_ in flower ___immature fruit ___mature fruit ___seed dispersing
___dormant ___seedlings

Area for sketch:

Landscape context (degree of fragmentation and connectivity, species composition, biological structure, ecological processes, and abiotic factors in the surrounding area):

_____some eutrophication by sea spray and bird dung possible

Condition: (*Condition is an integrated measure of the quality of biotic and abiotic factors, structures and processes within the occurrence, and the degree to which they affect the continued existence of the occurrence. Components of condition for species are: 1) reproduction and health, 2) ecological processes, 3) species composition and biological structure, 4) abiotic physical/chemical factors. Factors to consider: evidence of regular successful reproduction, habitat degradation, disturbance, presence of exotic species, the degree to which ecological processes are sustaining the habitat. Where possible include a comparison to other occurrences.*)

_____Comparatively small population; some plants very small, but healthy and no obvious threats

Notes (*land ownership, development plans, management activities, if any, other comments*): _____ Fort Rodd Hill & Fisgard Lighthouse National Historic Site

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:

 New/Update
 Update EO #

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 **1st visit, or repeat visit to this site:** 1st

Revisit needed? yes no Why?: _____

Specimen Collection # & Herbarium: (Please make a collection; in most cases, a collection is necessary to verify identification) 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 Belmont Battery, Ft. Rodd

UTM grid reference: (from blue grid on 1:50,000 NTS map): **MAP SHEET#** 92B/6
 (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
 Did you use a GPS unit to determine this UTM point? Y / N Y Precision of point (+/- metres) 3.8 m

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%+ **Aspect:** NNE

(Please note if elevation was derived from GPS unit)

Light:	Position: n.a.	Moisture: n.a.
<input checked="" type="checkbox"/> open	<input type="checkbox"/> crest	<input type="checkbox"/> inundated
<input type="checkbox"/> partial	<input type="checkbox"/> upper slope	<input type="checkbox"/> saturated (wet-mesic)
<input type="checkbox"/> filtered	<input type="checkbox"/> mid slope	<input type="checkbox"/> moist (mesic)
<input type="checkbox"/> shade	<input type="checkbox"/> lower slope	<input type="checkbox"/> dry-mesic
	<input type="checkbox"/> bottom	<input type="checkbox"/> 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): 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

Phenology: Indicate the number observed in each category (or check if numbers are unknown):
___ in leaf _40_ in bud _40_ in flower _40_ immature fruit ___ mature fruit ___ seed dispersing
___ dormant ___ seedlings

Area for sketch:

Landscape context (degree of fragmentation and connectivity, species composition, biological structure, ecological processes, and abiotic factors in the surrounding area): _____ some eutrophication by sea spray and bird dung ?

Condition: (*Condition is an integrated measure of the quality of biotic and abiotic factors, structures and processes within the occurrence, and the degree to which they affect the continued existence of the occurrence. Components of condition for species are: 1) reproduction and health, 2) ecological processes, 3) species composition and biological structure, 4) abiotic physical/chemical factors. Factors to consider: evidence of regular successful reproduction, habitat degradation, disturbance, presence of exotic species, the degree to which ecological processes are sustaining the habitat. Where possible include a comparison to other occurrences.*)

_____ healthy population without obvious threats

Notes (*land ownership, development plans, management activities, if any, other comments*): _____ Fort Rodd Hill & Fisgard Lighthouse National Historic Site

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 #___
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Species: Isoetes nuttallii, site 1 _____ **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): 04 / 30 / 2002 **1st visit, or repeat visit to this site:** 1st

Revisit needed? yes no Why?: _____

Specimen Collection # & Herbarium: (Please make a collection; in most cases, a collection is necessary to verify identification) _____ **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) _____

Yew Point, ca 650 m N of Fisgard Light House.

UTM grid reference: (from blue grid on 1:50,000 NTS map): _____ **MAP SHEET#** 92B/6
 (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° 26' 11.7" **Long** 123° 26' 54.4" **NAD** 83
 Did you use a GPS unit to determine this UTM point? Y / N Precision of point (+/- metres) _____

Habitat: (Please include dominant plants and identify plant communities, a general description of area including land forms/use) _____ Small muddy depression in grassy rock outcrop area. Immediate associate: *Triteleia hyacinthina*. Surrounding species: *Hordeum murinum*, *Poa annua*, *Lolium perenne*, *Camassia leichtlinii*, *Cerastium glomeratum*.

Topographic features: _____ **Elevation:** 5 m _____ metres feet (circle one) **Slope:** 5% **Aspect:** E

(Please note if elevation was derived from GPS unit)

Light:	Position:	Moisture:
<input checked="" type="checkbox"/> open	<input checked="" type="checkbox"/> crest	<input checked="" type="checkbox"/> inundated in winter & spring
<input type="checkbox"/> partial	<input type="checkbox"/> upper slope	<input type="checkbox"/> saturated (wet-mesic)
<input type="checkbox"/> filtered	<input type="checkbox"/> mid slope	<input type="checkbox"/> moist (mesic)
<input type="checkbox"/> shade	<input type="checkbox"/> lower slope	<input type="checkbox"/> dry-mesic
	<input type="checkbox"/> bottom	<input checked="" type="checkbox"/> dry (xeric) in summer

Population Data:

Population Size:
Estimated Number of Individuals (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems): 15 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): 0.2 sqm

Phenology: Indicate the number observed in each category (or check if numbers are unknown):

___x_ in leaf ___ in bud ___in flower ___immature fruit ___mature fruit ___seed dispersing
___dormant ___seedlings

Area for sketch:

Landscape context (degree of fragmentation and connectivity, species composition, biological structure, ecological processes, and abiotic factors in the surrounding area):

_____no other habitat in vicinity

Condition: (*Condition is an integrated measure of the quality of biotic and abiotic factors, structures and processes within the occurrence, and the degree to which they affect the continued existence of the occurrence. Components of condition for species are: 1) reproduction and health, 2) ecological processes, 3) species composition and biological structure, 4) abiotic physical/chemical factors. Factors to consider: evidence of regular successful reproduction, habitat degradation, disturbance, presence of exotic species, the degree to which ecological processes are sustaining the habitat. Where possible include a comparison to other occurrences.*)

_____Small healthy population limited by habitat

Notes (*land ownership, development plans, management activities, if any, other comments*): _____ Fort Rodd Hill & Fisgard Lighthouse National Historic Site

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:

 New/Update
 Update EO #

Species: Isoetes nuttallii, site12 **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 / 07 / 2002 **1st visit, or repeat visit to this site:** repeat
Revisit needed? yes no Why?: monitoring advised
Specimen Collection # & Herbarium: (Please make a collection; in most cases, a collection is necessary to verify 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 topographic 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): **MAP SHEET#** 92B/6
 (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° 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 land 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 scoparius, Danthonia californica, Hypochaeris radicata, Rumex acetosella, Holcus lanatus.

Topographic features: **Elevation:** 40 m metres feet (circle one) **Slope:** flat **Aspect:** -
 (Please note if elevation was derived from GPS unit)

Light:	Position: n.a.	Moisture:
<input checked="" type="checkbox"/> <u>open</u>	<input type="checkbox"/> <u>crest</u>	<input type="checkbox"/> <u>inundated</u>
<input type="checkbox"/> <u>partial</u>	<input type="checkbox"/> <u>upper slope</u>	<input checked="" type="checkbox"/> <u>saturated (wet-mesic) in winter/spring</u>
<input type="checkbox"/> <u>filtered</u>	<input type="checkbox"/> <u>mid slope</u>	<input type="checkbox"/> <u>moist (mesic)</u>
<input type="checkbox"/> <u>shade</u>	<input type="checkbox"/> <u>lower slope</u>	<input type="checkbox"/> <u>dry-mesic</u>
	<input type="checkbox"/> <u>bottom</u>	<input checked="" type="checkbox"/> <u>dry (xeric) in summer</u>

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
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

Phenology: Indicate the number observed in each category (or check if numbers are unknown):

__x__ in leaf __ in bud __ in flower __immature fruit __mature fruit __seed dispersing
__dormant __seedlings

Area for sketch:

Landscape context (degree of fragmentation and connectivity, species composition, biological structure, ecological processes, and abiotic factors in the surrounding area):

_____disturbed site; population probably a remnant of a former natural occurrence.

Condition: (*Condition is an integrated measure of the quality of biotic and abiotic factors, structures and processes within the occurrence, and the degree to which they affect the continued existence of the occurrence. Components of condition for species are: 1) reproduction and health, 2) ecological processes, 3) species composition and biological structure, 4) abiotic physical/chemical factors. Factors to consider: evidence of regular successful reproduction, habitat degradation, disturbance, presence of exotic species, the degree to which ecological processes are sustaining the habitat. Where possible include a comparison to other occurrences.*)

_____Originally in a natural community, the population still seems to go strong, despite mostly non-native associates. Due to the spring and winter wetness Scotch broom and young Douglas-fir which surround the *Isoetes* occurrence are unlikely to advance into *Isoetes* habitat. *Isoetes* is restricted to the wettest microhabitats and there is now no direct competition, even by the surrounding grasses. However, it should be monitored if *Agrostis stolonifera* expands its habitat towards the population.

Notes (*land ownership, development plans, management activities, if any, other comments*): _____ Fort Rodd Hill & Fisgard Lighthouse National Historic Site

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 #___
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Species: *Limnanthes macounii*, site 3 _____ **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): 04/26/2002 **1st visit, or repeat visit to this site:** repeat
Revisit needed? yes no Why?: _____ for census

Specimen Collection # & Herbarium: (Please make a collection; in most cases, a collection is necessary to verify identification) no collection; previously known occurrence **Was a photo taken?** Y

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) _____ Yew Point, 650 m N of Figsard Lighthouse,
Victoria, BC

UTM grid reference: (from blue grid on 1:50,000 NTS map): _____ **MAP SHEET#** 92B/6
 (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° 26' 10.8" **Long** 123° 26' 54.0" **NAD** 83
 Did you use a GPS unit to determine this UTM point? Y / N Y Precision of point (+/- metres) 4.2 m

Habitat: (Please include dominant plants and identify plant communities, a general description of area including land forms/use) _____ On shoreline rock outcrops exposed to ocean winds and eutrophication by birds and otters. In mosaic fashion in small draws and depressions between shoreline rock outcrops. Dominant associates: *Poa annua*, *Hordeum murinum*, *Lolium perenne*. Others: *Camassia leichtlinii*, *Triteleia hyacinthina*, *Montia howellii*, *Cerastium glomeratum*, *Calandrinia ciliata*.

Topographic features: **Elevation:** 5 m metres feet (circle one) **Slope:** 0 – 40% **Aspect:** S to E
 (Please note if elevation was derived from GPS unit)

- | | | |
|--|---|---|
| Light: | Position: | Moisture: |
| <input checked="" type="checkbox"/> open | <input checked="" type="checkbox"/> crest | <input type="checkbox"/> inundated |
| <input type="checkbox"/> partial | <input type="checkbox"/> upper slope | <input checked="" type="checkbox"/> saturated (wet-mesic) in winter, spring |
| <input type="checkbox"/> filtered | <input type="checkbox"/> mid slope | <input type="checkbox"/> moist (mesic) |
| <input type="checkbox"/> shade | <input type="checkbox"/> lower slope | <input type="checkbox"/> dry-mesic |
| | <input type="checkbox"/> bottom | <input checked="" type="checkbox"/> dry (xeric) in summer |

Population Data:
Population Size:
Estimated Number of Individuals (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems): 3,800 flowers on ca. 135 plants
Number of sub-populations & separation distances (if applicable): 6 subpopulations, average distance 2m
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): total coverage 4 sqm

Phenology: Indicate the number observed in each category (or check if numbers are unknown):

___ in leaf ___ in bud ___60 in flower ___75 immature fruit ___ mature fruit ___ seed dispersing
___ dormant ___ seedlings

Area for sketch:

Landscape context (degree of fragmentation and connectivity, species composition, biological structure, ecological processes, and abiotic factors in the surrounding area):

___ Eutrophication by bird droppings (Canada geese, gulls) and otter feces appears to make this population vigorous_ and at the same time threaten it through extremely lush growth of introduced grasses (*Hordeum*, *Lolium*, *Poa*).

Condition: (*Condition is an integrated measure of the quality of biotic and abiotic factors, structures and processes within the occurrence, and the degree to which they affect the continued existence of the occurrence. Components of condition for species are: 1) reproduction and health, 2) ecological processes, 3) species composition and biological structure, 4) abiotic physical/chemical factors. Factors to consider: evidence of regular successful reproduction, habitat degradation, disturbance, presence of exotic species, the degree to which ecological processes are sustaining the habitat. Where possible include a comparison to other occurrences.*)

___ Healthy population . Subsequent visits revealed very abundant seed set.

Notes (*land ownership, development plans, management activities, if any, other comments*):

___ Fort Rodd Hill & Fisgard Lighthouse National Historic Site

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 #___
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Species: Limnanthes macounii, site 7 **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): 04/29/2002 **1st visit, or repeat visit to this site:** repeat
Revisit needed? yes no Why?: _____

Specimen Collection # & Herbarium: (Please make a collection; in most cases, a collection is necessary to verify identification) no collection **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 below Belmont Battery, Fort Rodd Hill Natl.
 Historic Park

UTM grid reference: (from blue grid on 1:50,000 NTS map): _____ **MAP SHEET#** 92B/6
 (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° 25'51.5" **Long** 123° 27' 07.7" **NAD** 83
 Did you use a GPS unit to determine this UTM point? Y / N Y Precision of point (+/- metres) 3.7 m

Habitat: (Please include dominant plants and identify plant communities, a general description of area including land forms/use) Dominants in immediate vicinity of Limnanthes: Triteleia hyacinthina, Hordeum murinum, Lolium perenne, Medicago arabica, Poa annua, Trifolium variegatum. Others: Plecritis macrocera, Montia howellii, Cynosurus echinatus, Cerastium glomeratum, Aphanes arvensis, Hypochaeris radicata.

Topographic features: **Elevation:** 5 m metres feet (circle one) **Slope:** 5-20% **Aspect:** S

(Please note if elevation was derived from GPS unit) N

Light: <input checked="" type="checkbox"/> open <input type="checkbox"/> partial <input type="checkbox"/> filtered <input type="checkbox"/> shade	Position: <input type="checkbox"/> crest <input type="checkbox"/> upper slope <input type="checkbox"/> mid slope <input checked="" type="checkbox"/> lower slope <input type="checkbox"/> bottom	Moisture: <input type="checkbox"/> inundated <input type="checkbox"/> saturated (wet-mesic) <input checked="" type="checkbox"/> moist (mesic) in spring only <input type="checkbox"/> dry-mesic <input type="checkbox"/> dry (xeric)
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Population Data:

Population Size:

Estimated Number of Individuals (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems): 25 plants

Number of sub-populations & separation distances (if applicable): 3, separated by 1 m

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

Phenology: Indicate the number observed in each category (or check if numbers are unknown):

___ in leaf ___ in bud ___ in flower X immature fruit XX mature fruit ___ seed dispersing
___ dormant ___ seedlings

Area for sketch:

Landscape context (degree of fragmentation and connectivity, species composition, biological structure, ecological processes, and abiotic factors in the surrounding area):

_____ A typical habitat of the species, but native associates largely replaced by aliens

Condition: *(Condition is an integrated measure of the quality of biotic and abiotic factors, structures and processes within the occurrence, and the degree to which they affect the continued existence of the occurrence. Components of condition for species are: 1) reproduction and health, 2) ecological processes, 3) species composition and biological structure, 4) abiotic physical/chemical factors. Factors to consider: evidence of regular successful reproduction, habitat degradation, disturbance, presence of exotic species, the degree to which ecological processes are sustaining the habitat. Where possible include a comparison to other occurrences.)*

_____ Rather small population threatened to be overwhelmed by non-native plants.

Notes (land ownership, development plans, management activities, if any, other comments): _____ Fort Rodd Hill & Fisgard Lighthouse National Historic Site

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 #___
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Species: Trifolium depauperatum, site 11_ **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 / 01 / 2002 **1st visit, or repeat visit to this site:** 1st
Revisit needed? x yes ___ no Why?: there may be more in other
years

Specimen Collection # & Herbarium: (Please make a collection; in most cases, a collection is necessary to verify identification) not collected **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) _____

On northern shoreline of Esquimalt Lagoon, ca 350m NW of bridge across outlet

UTM grid reference: (from blue grid on 1:50,000 NTS map): **MAP SHEET#** 92B/6
 (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' 56.3" **Long** 123° 27' 39.1" **NAD** 83
 Did you use a GPS unit to determine this UTM point? Y / N Y Precision of point (+/- metres) 8.3 m

Habitat: (Please include dominant plants and identify plant communities, a general description of area including land forms/use) In short turf of annual herbs and grasses on S-facing slope exposed to ocean winds. Dominant associates: *Triteleia hyacinthina*, *Aphanes arvensis*, *Aira praecox*. Others: *Trifolium dubium*, *Trifolium microcephalum*, *Erodium cicutarium*, *Silene gallica*

Topographic features: **Elevation:** 5 m metres feet (circle one) **Slope:** 35% **Aspect:** SSE
 (Please note if elevation was derived from GPS unit)

- | | | |
|--|---|---|
| Light: | Position: | Moisture: |
| <input checked="" type="checkbox"/> open | <input type="checkbox"/> crest | <input type="checkbox"/> inundated |
| <input type="checkbox"/> partial | <input type="checkbox"/> upper slope | <input type="checkbox"/> saturated (wet-mesic) |
| <input type="checkbox"/> filtered | <input checked="" type="checkbox"/> mid slope | <input checked="" type="checkbox"/> moist (mesic) in spring |
| <input type="checkbox"/> shade | <input type="checkbox"/> lower slope | <input type="checkbox"/> dry-mesic |
| | <input type="checkbox"/> bottom | <input checked="" type="checkbox"/> dry (xeric) in summer |

Population Data:

Population Size:
Estimated Number of Individuals (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems): Only one plant seen **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): _____

Phenology: Indicate the number observed in each category (or check if numbers are unknown):
___ in leaf ___ in bud _1_ in flower ___ immature fruit ___ mature fruit ___ seed dispersing
___ dormant ___ seedlings

Area for sketch:

Landscape context (degree of fragmentation and connectivity, species composition, biological structure, ecological processes, and abiotic factors in the surrounding area): _____ on one of several rocky areas sloping to the shoreline, receiving slight spring seepage

Condition: (*Condition is an integrated measure of the quality of biotic and abiotic factors, structures and processes within the occurrence, and the degree to which they affect the continued existence of the occurrence. Components of condition for species are: 1) reproduction and health, 2) ecological processes, 3) species composition and biological structure, 4) abiotic physical/chemical factors. Factors to consider: evidence of regular successful reproduction, habitat degradation, disturbance, presence of exotic species, the degree to which ecological processes are sustaining the habitat. Where possible include a comparison to other occurrences.*)

_____ species combination of community similar to that of other *Trifolium depauperatum* sites; number of introductions similar; no obvious disturbance

Notes (*land ownership, development plans, management activities, if any, other comments*): _____ Fort Rodd Hill & Fisgard Lighthouse National Historic Site

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 #___
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Species: *Trifolium depauperatum*, sites 2 and 4 _____ **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*): 04/26/2002 _____ **1st visit, or repeat visit to this site:** ?
Revisit needed? yes no Why?: _____

Specimen Collection # & Herbarium: (*Please make a collection; in most cases, a collection is necessary to verify 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 topographic maps (if possible, but any maps are welcome)*) Yew Point, 650 m N of Fisgard Lighthouse, Victoria, BC

UTM grid reference: (*from blue grid on 1:50,000 NTS map*): _____ **MAP SHEET#** 92B/6
(*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' 51.4" to 26° 11.1" **Long** 123° 26' 54.5" to 27° 09.4" **NAD** 83
Did you use a GPS unit to determine this UTM point? Y / N Y Precision of point (+/- metres) 4.2m

Habitat: (*Please include dominant plants and identify plant communities, a general description of area including land forms/use*) On a low bench (main population) and on animal trail parallelling shoreline and bordered by rock outcrops. Shallow soil, highly exposed to ocean winds. Vegetation is short turf of the following Dominants: *Triteleia hyacinthina, Trifolium variegatum, Trifolium depauperatum.* Others: *Trifolium willdenowii, Triphysaria pusilla, Silene gallica, Plantago elongata, Aphanes arvensis, Erodium cicutarium, Lomatium utriculatum, Cerastium glomeratum, Geranium molle, Cynosurus echinatus, Medicago arabica, Vicia hirsuta, Armeria maritima, Aira praecox, Vulpia bromoides, Veronica arvensis, Vicia lathyroides, Bromus hordeaceus, Bromus sterilis.*

Topographic features: **Elevation:** 4 – 7 m _____ metres feet (*circle one*) **Slope:** 30% **Aspect:** SSE
(*Please note if elevation was derived from GPS unit*)

Light:	Position:	Moisture:
<u>open</u>	<u>crest</u>	<u>inundated</u>
<u>partial</u>	<u>upper slope</u>	<u>saturated (wet-mesic)</u>
<u>filtered</u>	<u>mid slope</u>	<u>X moist (mesic) in spring</u>
<u>shade</u>	<u>X lower slope</u>	<u>dry-mesic</u>
	<u>bottom</u>	<u>X dry (xeric) in summer</u>

Population Data:

Population Size:
Estimated Number of Individuals (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems): ca. 60 plants in site 4, plus 110 plants in site 2, including trail between 2 and 4.

Number of sub-populations & separation distances (if applicable): small subpop's strung along animal trail
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): total of 3.5 sqm

Phenology: Indicate the number observed in each category (or check if numbers are unknown):
___ in leaf ___ in bud X in flower ___immature fruit ___mature fruit ___seed dispersing
___dormant ___seedlings

Area for sketch:

Landscape context (degree of fragmentation and connectivity, species composition, biological structure, ecological processes, and abiotic factors in the surrounding area):

Habitat (i.e. short herbaceous/grassy turf conditioned by high wind exposure and shallow soil) is restricted. Species has taken advantage of similar linear habitat along an animal trail connecting the two subpopulations (sites 2 and 4).

Condition: (*Condition is an integrated measure of the quality of biotic and abiotic factors, structures and processes within the occurrence, and the degree to which they affect the continued existence of the occurrence. Components of condition for species are: 1) reproduction and health, 2) ecological processes, 3) species composition and biological structure, 4) abiotic physical/chemical factors. Factors to consider: evidence of regular successful reproduction, habitat degradation, disturbance, presence of exotic species, the degree to which ecological processes are sustaining the habitat. Where possible include a comparison to other occurrences.*)

Small to medium-size populations, apparently healthy.

Notes (*land ownership, development plans, management activities, if any, other comments*):

Fort Rodd Hill & Fisgard Lighthouse National Historic Site

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(fax: 250-387-2733) **THANK YOU!**