



**SALT SPRING ISLAND PARKS AND ECOLOGICAL
RESERVES - TERRESTRIAL ECOSYSTEM MAPPING
AND CONSERVATION ASSESSMENT**

for:

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Tania Tripp was project manager. Jane Thomson was assistant project manager and provided GIS support, with assistance from Aleena Nowak. Derrick Marven conducted bird and butterfly surveys in Ruckle Provincial Park. Dr. Adolf and Oluna Ceska provided rare plant survey data for Mt. Tuam Ecological Reserve, adjacent Crown Land assessment areas, and Burgoyne Bay Provincial Park. In addition, they provided us with previously collected data for rare plant records in Parks and Ecological Reserves on Salt Spring Island. Burgoyne Bay Provincial Park surveys were greatly assisted by local naturalist Karen Ferguson. Salt Spring Island Conservancy (Robin Annschild - biologist) was also very helpful in providing local knowledge of rare species found within the Parks and Ecological Reserves.

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EXECUTIVE SUMMARY

Madrone Environmental Services Ltd. conducted detailed field sampling to support ecosystem mapping and interpretations for BC Parks on Salt Spring Island at Resources Inventory Standards Committee (RISC) Level 3 sampling intensity (objective 26-50% polygon sampling). This project represents an incremental augmentation of the sampling and mapping for existing ecosystem mapping projects for Integrated Land Management Bureau (Ministry of Agriculture and Lands) and Islands Trust. The areas targeted for samplings were: Mount Maxwell Provincial Park and Mount Maxwell Ecological Reserve, Burgoyne Bay Provincial Park and Addition, Ruckle and Beaver Point Provincial Parks and Cusheon Cove Addition, Mount Erskine Provincial Park, and Mount Tuam Ecological Reserve and Optional (Crown Land) Assessment Areas. Surveys were conducted from January to July 2007, comprising data collection for surficial geology, soils, drainage, terrestrial ecosystems, rare plants and disturbance.

Based on existing information and field data collected, terrestrial ecosystem maps were developed to fulfill objectives for the projects described above. Polygons within BC Parks were further evaluated with respect to habitat features for known occurrences of rare wildlife species, rare plants, and conservation evaluation data. The RISC draft 2006 conservation evaluation methodology and forms were adapted to gather quantitative information in order to evaluate the polygons within the Parks and Ecological Reserves. Factors that were assessed include: ecosystem type, structural stage, known presence or likelihood to contain rare species, polygon size, shape, level of fragmentation, invasive species abundance, and sensitivity or resilience to disturbance. Each polygon within the study area was rated according to this standardized framework and assigned a conservation ranking that can be used to guide management decisions. Data and conservation evaluation ranks were reviewed in the context of each Park and Ecological Reserve to suggest management options and their relative applicability or suitability.

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Salt Spring Island Parks and Ecological Reserves - TEM / Conservation Assessment

1.0 INTRODUCTION

Madrone Environmental Services Ltd. (Madrone) was contracted by BC Parks to provide a series of interpretive maps to guide management priorities for six current and proposed Parks and Ecological Reserves on Salt Spring Island. This project is a value-added application to capitalize on the ongoing terrestrial ecosystem mapping (TEM) of the Coastal Douglas-Fir (CDF) biogeoclimatic zone by Madrone. The areas of interest were: Mount Maxwell Provincial Park, Mount Maxwell Ecological Reserve, Burgoyne Bay Provincial Park and Addition, Mount Erskine Provincial Park, Ruckle and Beaver Point Provincial Parks and Cusheon Cove Addition, Mount Tuam Ecological Reserve, and Optional (Crown Lands) Assessment Areas in the vicinity of Mount Tuam, totalling 2,237 ha (Figure 1).

In spring and summer of 2007, Madrone conducted field work on Salt Spring Island to support TEM. During this field work, additional sampling intensity was focused on properties identified by BC Parks with the aim of achieving 26-50% polygon visitation in those areas. Sites were also evaluated using a modified standard provincial Conservation Evaluation form tailored to address the objectives identified by BC Parks. The resulting database and shapefiles containing the polygon data were analyzed to generate a synthesis of the ecosystems and their condition within the areas of interest. Each ecosystem type was evaluated with respect to various management priorities and ecological capacity of the site to sustain different management activities. A series of thematic maps were generated to fulfill the project objectives. The end product aims to provide baseline data and guide management decisions.

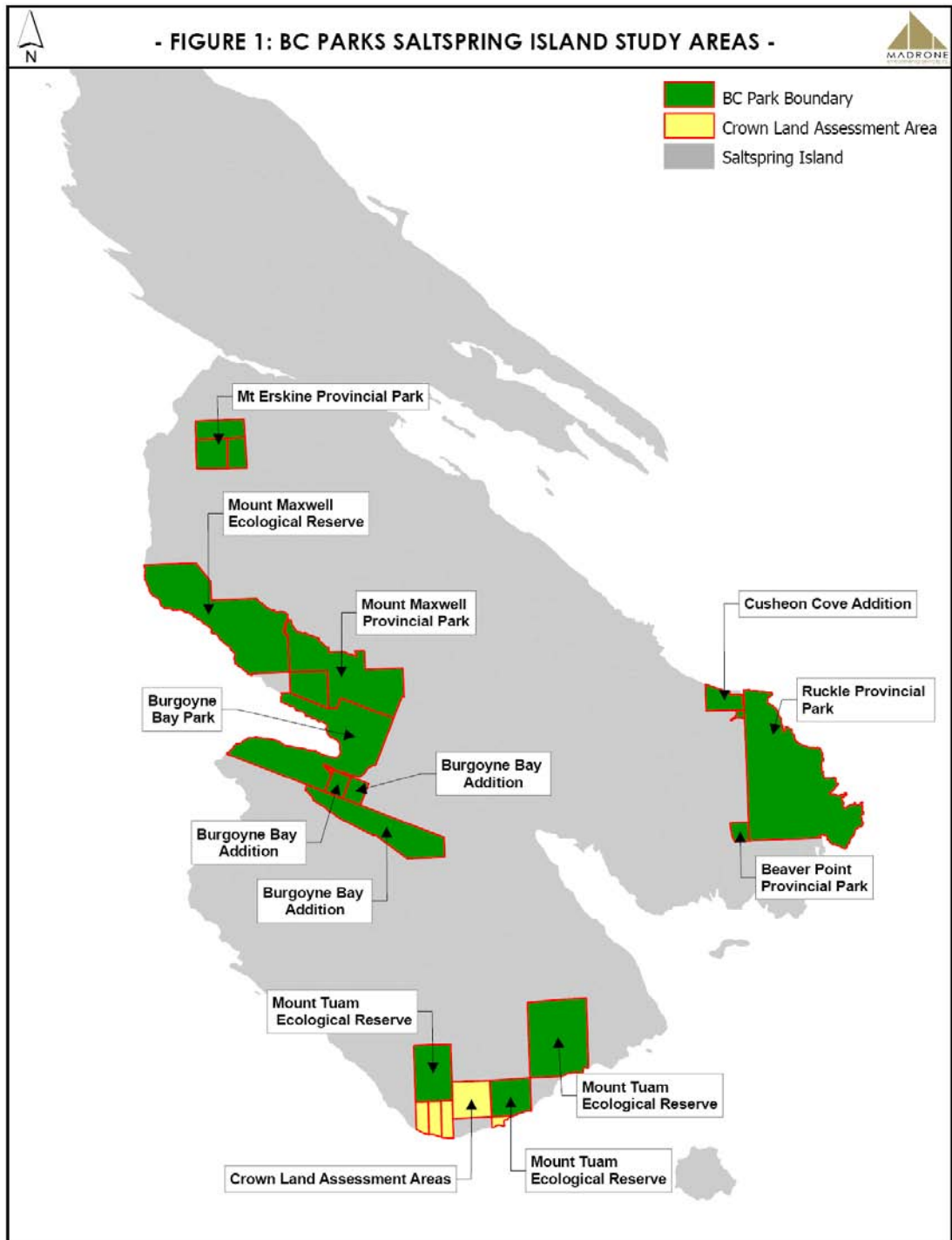


Figure 1. Sampling areas for BC Parks on Salt Spring Island.

1.1 Objectives

The objectives of the project are as follows:

- Identify and map sensitive areas by delineating existing TEM polygons.
- Ground-truth 26-50% of TEM polygons (Level 3 survey intensity) within park boundaries and additional assessment areas adjacent to Mount Tuam Ecological Reserve.
- Based on field data, develop management recommendations for polygons with feature of interest depending on ecosystem type and feature, disturbance intensity and extent, restoration capability, conservation priority, and appropriate sites for recreational development.
- Provide a descriptive summary for each ecosystem indicating potential and known rare element occurrences.
- Provide management strategies/recommendation for protecting identified species.
- Provide a set of thematic maps to display results in a manner that is straightforward to interpret and comprehend.

Applicable objectives are included in this report and associated maps; the remainder consists of a set of digital files meeting the above criteria.

2.0 METHODS

2.1 Background Research

The study areas fall within two biogeoclimatic units: the CDFmm, or Coastal Douglas-Fir biogeoclimatic zone, moist maritime subzone (CDFmm), and the Coastal Western Hemlock zone, very dry maritime subzone, eastern variant (CWHxm1). The primary determinant of the boundary between the two is elevation: the CDFmm occurs from sea level to approximately 150 m elevation, and the CWHxm is above this, reflecting corresponding differences in temperature, duration of the growing season, precipitation, and ecosystem and species distributions. However, based on field observations both from the on-going terrestrial ecosystem mapping and prior projects, the delineation between the CDFmm and CWHxm on Salt Spring Island was adjusted to reflect observed, site specific characteristics.

As a component of the CDFmm TEM project, supported by the Integrated Land Management Bureau (ILMB) and Ministry of Environment (MoE), with additional support on Salt Spring Island by Islands Trust, considerable background resources had been compiled and reviewed for the study area. Materials included reports and

articles, maps, databases, and electronic files on the geology, geomorphology, glacial history, vegetation distribution, rare element occurrences of plant and wildlife species and ecosystems (BC CDC 2007), land use, sensitive ecosystem inventory (SEI) (Ward et al. 1997), contemporary and historic Garry oak ecosystems, and disturbance history. Other resources included: TRIM files, soils maps (van Vliet et al. 1987), 2005 colour 1:16,500 aerial photographs, local bird checklists, and other information from naturalist groups.

Ecosystem classification and description followed Green and Klinka (1994), BCMoE and BCMoF (1998), RIC (1998), and Erickson and Meidinger (2007) for Garry oak communities to the sub-association level. Four types of oak communities were recognized within the CDFmm based on photo interpretation at the 1:16,500 scale and field verification: Garry oak-Douglas-fir (CDFmm/03), Garry oak-brome/mixed grasses (CDFmm/00), Garry oak-oceanspray (CDFmm/00), and Garry oak-moss (typically *Dicranum* or *Racomitrium* species) (CDFmm/00). All but the first were non-correlated ecosystem units and received approval for project use from provincial ecosystem correlators. Bioterrain base mapping was conducted according to RIC (1996) and Howes and Kenk (1997). Soils were characterized using the Canadian System of Soil Classification (Soil Classification Working Group 1998), following provincial standards (BCMoE and BCMoF 1998).

2.2 Field Sampling

The background research, combined with the requisite for sampling >26% of the polygons (goal of 50% of polygons if possible) within parks, was used to target sampling sites. Accessibility was somewhat limiting in some areas, primarily due to terrain and private property. Sites of interest due to their high use and high conservation value based on known or mapped sensitive ecosystems were targeted for sampling. Sampling in Parks and Ecological Reserves also reflected, to a lesser extent, the sampling requirement for the overall ecosystem mapping of the CDFmm subzone, where zonal and representative site types were selected for sampling in addition to rarer sites. Polygons requiring field verification were also selected where ecosystem attributes and/or surficial geology were not apparent from the aerial photos.

Madrone was retained by the Ministry of Environment in 2002 to do terrestrial ecosystem mapping of Mount Maxwell Ecological Reserve at 1:5,000 (Madrone 2003). Relevant data were used in this report to avoid duplicate sampling in the Mount Maxwell Ecological Reserve.

In March, April, and July of 2007, the BC Parks study areas were visited to collect ecosystem field data. Polygons were also evaluated quantitatively using a modified provincial Conservation Evaluation form to generate rankings of the ecological condition and resilience to disturbance. A sample form and the evaluation form and formula are included in Appendix I. Rare plant surveys were conducted by Adolf and Oluna Ceska, expert botanists and rare plant specialists. Karen Ferguson (local naturalist) guided the Madrone crew during their first visit to Burgoyne Bay Provincial Park and joined the crew on subsequent surveys of ecosystems and for rare plants. Karen provided Madrone with a bird list for the area that has been collected and added to over a number of years. During the first visit to Mt. Erskine Provincial Park, the ecosystem crew (Tania Tripp and Gillian Radcliffe) were joined by Peggy Burfield (BC Parks) and Robin Annschild (Salt Spring Island Conservancy) and Larry Appleby (Warden).

2.3 Ecosystem mapping

Terrestrial ecosystems were mapped according to provincial RISC (1998) standards. Bioterrain (i.e., surficial geology and drainage) and soils data formed the foundation of the ecosystem map. The surficial material, thickness, drainage, mesoslope position, and aspect influence the potential and actual ecosystems that occur on a site. The study area was subdivided first into polygons with discrete bioterrain features. Where evident, these bioterrain polygons were further split to reflect different ecosystems, structural stages, aspect, disturbance, and features such as riparian areas.

Each polygon was assigned a label indicating the proportion of each ecosystem within the polygon, the ecosystem type, site modifiers (e.g., slope, warm or cool and aspect, shallow soils), structural stage, stand composition (where applicable: conifer, broadleaf, or mixed), and disturbance codes and modifiers. As per the provincial (RISC) standards, polygons could consist of up to three unique ecosystem types. Whenever possible, we attempted to map smaller, pure polygons (i.e., consisting of only one ecosystem type). Bioterrain and ecosystem polygons and labels were adjusted to ensure both were integrated to meet the project objectives.

2.3.1 Biogeoclimatic Zone Delineation

Lines demarcating biogeoclimatic units (zones, subzones, variants) were adjusted based on prior data, as well as current field observations. On steep, well-drained south-facing slopes, the CDFmm was elevated to approximately 500 m – 550 m to reflect ecosystems actually occupying the sites, while on cool aspects the line was adjusted downwards from the default elevation of 150 m to approximately 120 m.

This adjustment received the approval of the Regional Ecologist for MoFR. The CWHxm1/xm2 boundary was retained at approximately 650 m since field data did not support adjustments. No Parks or Ecological Reserves on Salt Spring Island were above the CWHxm1 boundary.

Mount Erskine Provincial Park was entirely within the CWHxm1. Mount Tuam Ecological Reserve and the adjacent Crown Lands assessment areas were entirely within the CDFmm, which was adjusted upwards on the warm aspect to accommodate the ecosystems characteristic of this subzone. Ruckle and Beaver Point Provincial Parks and the associated Cusheon Cove Addition are also contained within the CDFmm. Burgoyne Bay Provincial Park, Mount Maxwell Provincial Park and Mount Maxwell Ecological Reserve intersected both the CDFmm and CWHxm1 biogeoclimatic units.

2.3.2 *Quality Assurance*

Draft maps, typed photos, and databases were sent to the Ministry of Environment for Quality Assurance. Bioterrain and TEM linework, labeling, and adherence to standards were screened. Upon receipt of the feedback, modifications were incorporated, and some areas were re-mapped for improved consistency. The final database was tested for accuracy and consistency with standards through an error-checking application, and (notwithstanding some new codes that the application was not yet upgraded to recognize) was deemed error-free.

2.4 Digital Products

Bioterrain and ecosystem polygon attributes were entered into a database that was linked to a geographic information system (GIS) platform. This facilitates interpretation of the data, as well as data analysis, standardizes the data to comply with provincial requirements, and enables the project to fit into the framework of other ecosystem mapping projects throughout B.C. The TEM framework includes digital deliverables that comply with RISC standards for TEM (RISC 2000, 2003).

2.5 Conservation Ranking

The Conservation Data Centre (CDC) standard forms and draft conservation evaluation methodology (RISC 2006) were adapted to serve the objectives of this project and provide objective, quantitative rankings of mapped ecosystems in protected areas of Salt Spring Island with respect to rarity, occurrence of rare elements, sensitivity to disturbance, resilience, fragmentation, and presence of invasive species.

Appendix I contains a sample form and detailed description of the formulae, ecosystem codes, site modifiers, and rationales used for rankings. The following paragraphs provide a more detailed methodology of the steps applied to determine the conservation ranking of each polygon.

Step 1

The primary determinant of the inherent capacity of a site (polygon) to support diversity and provide habitat value is its ecosystem type. For forested ecosystems, structural stage is the factor with the largest influence in this respect, such that old-growth and mature stands, which are the most imminent candidates for old-growth recruitment (structural stages 7 and 6, respectively), receive the highest rankings. Their multi-layered canopies and relatively high species diversity, combined with features such as snags, coarse woody debris (CWD), and well-developed humus layers, support a wide range of flora and fauna. Earlier successional stages are ranked lower, reflecting their capacity over the long term to provide high value habitat if undisturbed, while not presently supporting the diversity or structure to do so. Non-forested ecosystems were ranked high if they were likely or known to support highly diverse ecosystem types, sensitive ecosystems, or a wide variety of faunal habitat. Garry oak ecosystems, herbaceous meadows, rock outcrops, (often supporting sensitive communities of seepage-adapted plants or small pockets of sensitive herbaceous species), cliffs, water bodies, and wetlands were all ranked high.

Anthropogenic sites were ranked according to their long-term capacity to support biodiversity and provide habitat. Most vegetated types were ranked relatively low, reflecting their limited carrying capacity and high cover of invasive species; often management inputs are required to maintain the areas in these conditions (e.g., fields, orchards, etc.). Seasonally flooded fields were ranked higher, reflecting their known value to provide seasonal habitat to migratory bird species, and to recover, in the absence of disturbance, to ecosystems that are often moderately sensitive to disturbance, such as forests with fluctuating water tables that are susceptible to soil compaction. Other areas rated low were those whose detrimental impacts would persist over the long term, namely gravel pits/quarries and paved areas.

Step 2

The next step was to review existing data and determine whether any red- or blue-listed species were located in any of the polygons. If any red-listed species was present the rank from step 1 (ecosystem type/structural stage) was elevated to the highest rank. If from 1 to 3 blue-listed species were found in the polygon, the rank

was elevated by one category. If more than 3 blue-listed species occurred, the rank was elevated by two categories. Typically, however, polygons with incidences of red and blue-listed species already were ranked high for ecosystem type/structural stage.

Step 3

Anthropogenic sites were adjusted according to their capacity to support habitats known to contain red and blue-listed species. Any known occurrences of red-listed species elevated the rank from step 2 by two categories. Any known occurrences of blue-listed species elevated the rank from step 2 by one category.

Step 4

The next step combined several factors to quantify ecological condition. First, polygon size was categorized, based on the assumption that larger (and more contiguous) ecosystems are less negatively affected by disturbance, and provide more buffered, interior habitat. The proportion of fragmentation was rated, based on adjacent or within-polygon roads and forest harvesting. Trails were not considered in this index since they are small enough in the parks that they do not constitute barriers to species dispersal or colonization.

The shape of polygons was then rated: round polygons were rated high to reflect the proportion of edge to interior habitat for restricted species; linear habitats were rated low since the exclusive edge habitat is susceptible to disturbance and provides habitat for a limited number of species, which are often generalists that do well in disturbed habitats.

The proportion of invasive species was rated where data was available. Where this information was lacking (i.e., the polygon was not field verified), this column was left blank, and did not influence the overall condition ranking. Sensitivity to disturbance was then rated: sites with thin and very thin soils received elevated rankings, as wet sites with wetlands and fluctuating water tables. Rankings for these five factors (polygon size, fragmentation, shape, proportion of invasive species, sensitivity to disturbance) were averaged to yield an overall condition ranking.

Step 5

The final step was to assign weights to the above rankings for each step, reflecting their relative importance for the project objectives and ecological sensitivity. First, the rankings (from 1 to 6 for each step) were converted into an index from 0 to 1. Next, the index value from each step was multiplied by the weighting factor. These

weighted values were summed to produce the total conservation ranking for each polygon in each park.

Where there were multiple ecosystems within a polygon, the component (decile) with the highest ranking was used to achieve the most conservative rating for BC Parks objectives. For example, if an ecosystem component representing 10% of the polygon was considered to have a very high conservation ranking, then the entire polygon defaulted to that rank.

3.0 RESULTS

3.1 Field sampling and mapping

Altogether, 176 plots were sampled in the parks areas (15 full plots, 61 ground inspection plots and 100 visuals). After gathering field data and again after receiving feedback on the mapping from MoE, polygon boundaries were adjusted and some polygons ended up having multiple plots within them after adjacent polygons were amalgamated. Similarly, creating additional polygons by subdivision lowered the sampling intensity, but increased the accuracy of the map by delineating more discrete, homogeneous ecosystems. A total of 119 of the total 283 polygons within parks were sampled, yielding an aggregate sampling intensity of 42% across all parks. Of the 283 polygons, 10 are shared between Mt. Maxwell and Burgoyne Bay Provincial Parks (i.e., 10 polygons are double counted due to the park boundary bisecting them). In fact, a number of TEM polygons were bisected by park boundaries for the purpose of analysis of ecosystem data within the parks. These intersects created a number of small (<0.5 ha) sliver polygons along the edges of the Park and Ecological Reserve boundaries (refer to TEM maps of the study area and Figures 3 through 8). The result of these slivers is a biased impression of field sampling (i.e., if the <0.5 ha slivers were removed, the sampling intensity would increase significantly because there would be fewer total polygons).

Table 1 summarizes the area, number of polygons, and number of plots sampled within each of the six protected areas and the Optional Crown Lands assessment areas. The data for Mount Maxwell Ecological Reserve include 32 plots sampled by Madrone in 2002 (Madrone 2003).

Table 1. TEM Sampling within Salt Spring Island Parks and Ecological Reserves.

Park Name	Total Area (ha)	Total polygons	Total plots	Sampled polygons	Sampling intensity (%)
Burgoyne Bay Provincial Park & Burgoyne Bay Addition	321 192	80	47	28	35%
Mount Maxwell Provincial Park	231	27	11	9	33%
Mount Maxwell Ecological Reserve	345	47	32	28	60%
Mount Tuam Ecological Reserve and Adjacent Crown Lands assessment areas	363 128	58 (49 Eco Reserve + 9 Crown Lands)	30	21	36%
Mt Erskine Park	110	22	26	10	45%
Ruckle & Beaver Point Provincial Parks and Cusheon Cove Addition	547	59	31	23	39%
Totals	2,237	283*	176	119	42%

*10 polygons are shared between the south end of Mt. Maxwell Provincial Park and the north end of Burgoyne Bay Provincial Park.


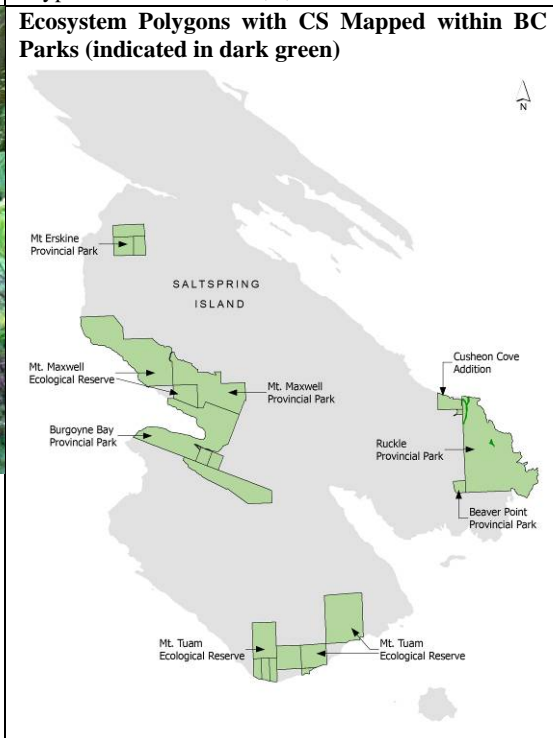
3.2 Ecosystem Descriptions


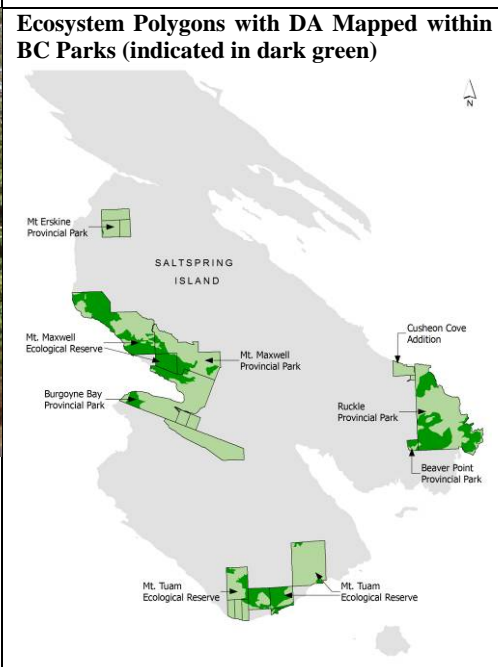
The following section contains a summary of the mapped ecosystem units within the parks. The initial code is the ecosystem unit map code, followed by the provincial biogeoclimatic ecosystem classification (BEC) code including zone, subzone, variant (if any) and site series, then the name of the dominant plant association, followed by a descriptive synopsis of the sites. Forested and non-forested ecosystems are described in separate sections due to their differences in classification, ecological values, and relevant management inputs and priorities.


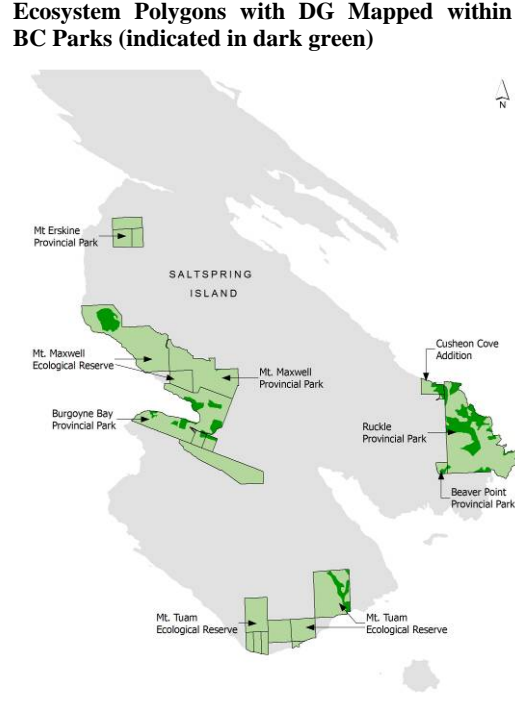
All biogeoclimatic units on Salt Spring Island are characterized by cool mesothermal climates. The CDFmm has a drier climate and warmer values for the temperatures of the coldest month and annual mean than the CWHxm1. Temperatures almost never fall below freezing. This zone is characterized by dry, warm summers with typical summer drought, and moderately warm winters where temperatures are infrequently below freezing. Most precipitation falls during the winter and spring, very little as snow. The remainder of the area is within the CDFmm. This area is a gradual transition from the CWHxm1 so may not be immediately distinct.


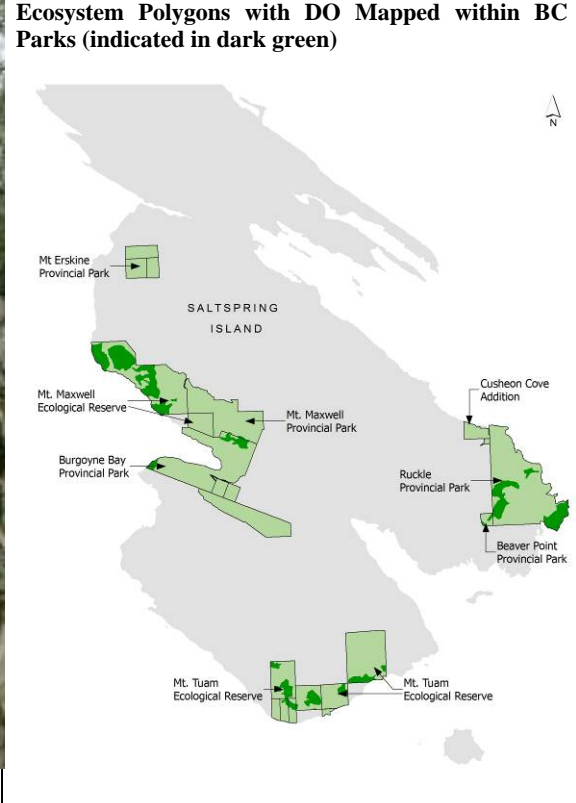
Refer to the TEM legend (Appendix XII) for definitions of site modifiers, soil nutrient regime (SNR), soil moisture regime (SMR) and other mapping terminology encountered in the following ecosystem descriptions.


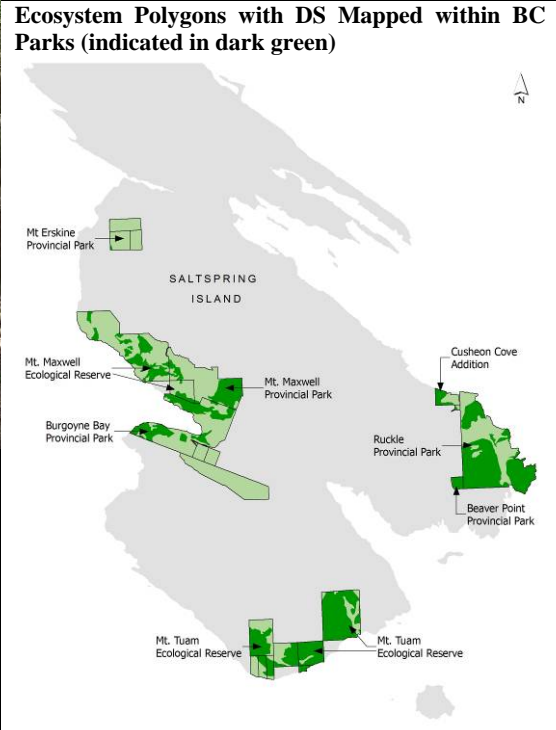
3.2.1 CDFmm – Forested ecosystems


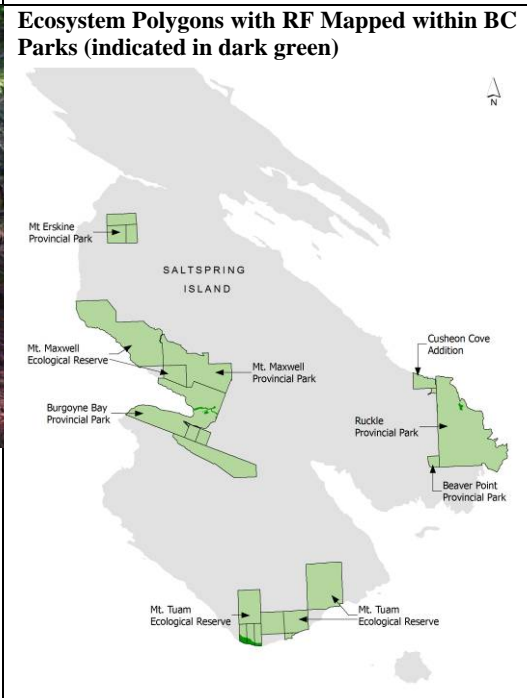
TEM Code	Site Association	Site Series
CDFmm - CS	Western redcedar—Slough sedge	14
<p>Site Description</p> <p>These swamp forests occupy poorly drained flat sites to depressions. Redcedar and swordfern may dominate elevated microsites, while sedges, ladyfern, and horsetails occupy hollows with occasional skunk cabbage. Soils are moderately deep to deep (0.5-1+ m) with medium texture, typically gleyed, with fluctuating water tables. Tree species are limited to shade- and moisture-tolerant trees with relatively shallow roots: western redcedar, grand fir on margins, and black cottonwood with minor amounts of red alder. Shrubs in this site series are diverse, with Indian-plum, snowberry, roses, infrequent currants/gooseberry, ninebark, black twinberry, red-osier dogwood, and thimbleberry the most frequently observed. Herbaceous species were variable, with slough sedge the most common component of the herb layer, and Cooley’s hedge nettle and small-flowered rush also common. Moss tended to occupy little of the substrate, and only Oregon beaked moss was consistently noted; large leafy moss and coastal leafy moss were sometimes present.</p> <p>This ecosystem unit was only mapped in Ruckle Provincial Park. There is a high potential for this ecosystem to contain the red-listed plant community (red alder/slough sedge [black cottonwood]), which is associated with site series 14 in the CDFmm.</p>		<p>Elevation (m): 0-150 Slope (%): 0-35 Aspect (°): variable Surficial material: O, M, L, W^G Drainage: m-p SMR: 6-7 SNR: C-E</p>
Assumed modifiers: d, j, m		Atypical site modifiers: d, s, w
	<p>Ecosystem Polygons with CS Mapped within BC Parks (indicated in dark green)</p> 	


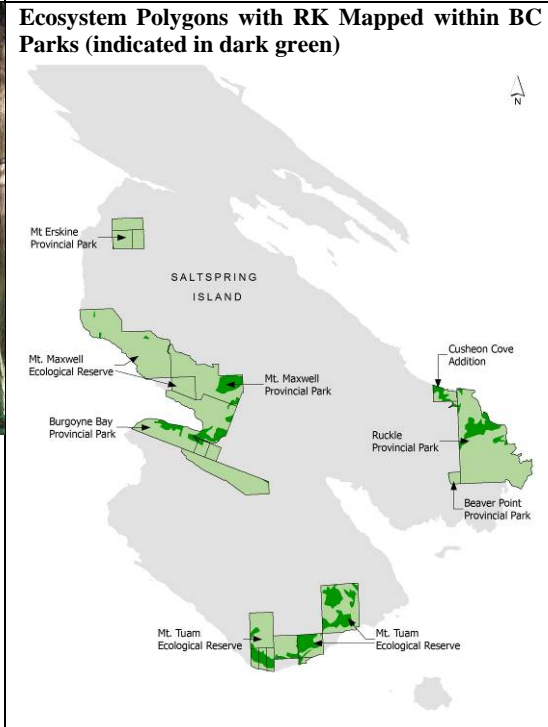
TEM Code	Site Association	Site Series
CDFmm - DA	Douglas-fir—Shore pine—Arbutus	02
<p>Site Description</p> <p>Douglas-fir-Shore pine-Arbutus (DA, Site Series 02) forests are found on drier, rapid- to well-drained poorer sites including crests, upper slopes, dry aspects, and sites with deeper medium-textured (fine sand to silty loam) soils. Depending on the mesoslope position, soil texture, and aspect, they may be underlain by a thin veneer of soil derived from glaciomarine or till origin overlying bedrock. Forested ecosystems are dominated by Douglas-fir and arbutus, with shore pine on the driest and poorest sites (rocky ridge crests). Garry oak is an infrequent minor component on rock outcrops down to sea level. Forest canopies are open (<50% canopy cover), indicating the limited moisture and nutrient resources of these sites.</p> <p>The understory has a relatively diverse layer of drought-tolerant shrubs including orange and hairy honeysuckle, dull Oregon grape, oceanspray, falsebox, baldhip rose and snowberry. Herbs are relatively sparse and seasonally evident, with oniongrass, sandwort, Pacific sanicle and purple peavine the most common. Mosses and lichens cover much of the ground and woody debris (where present), featuring electrified cat’s tail moss, Oregon beaked moss and Cladonia species. Although ground fires were historically frequent, suppression over the past century has contributed to denser understories and thicker accumulations of forest floor, and the corresponding increased fire hazard (McDonald and Tappeiner 1990). This has also been linked to increased incidences of pathogens in arbutus in the U.S. portion of its range (Farr et al. 2005).</p> <p>This is a common ecosystem type mapped in all of the study areas except for Mt. Erskine Provincial Park. Mature stands (structural stages 5 and 6) provide valuable habitat for cavity nesting birds. There is a high potential for this ecosystem to contain the red-listed plant community (Douglas-fir - arbutus), which is associated with site series 02 in the CDFmm.</p>		<p>Elevation (m): 0-500 Slope (%): 15-60 Aspect (°): 135-270 (270-135) Surficial material: M, R Drainage: w-r SMR: 0-1 SNR: A-C</p>
Assumed modifiers: d, j, m, r		Atypical site modifiers: h, k, r, s, v, w, x, z
	<p>Ecosystem Polygons with DA Mapped within BC Parks (indicated in dark green)</p> 	


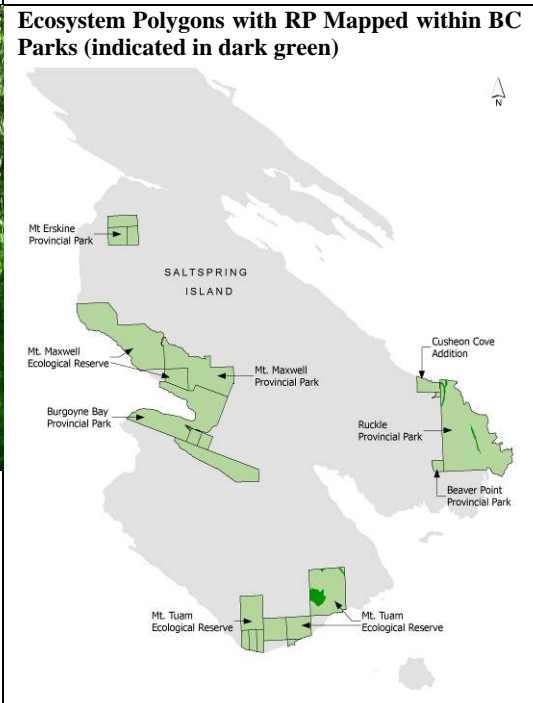
TEM Code	Site Association	Site Series
CDFmm - DG	Douglas-fir—Grand fir—Oregon grape	04
<p>Site Description</p> <p>These mesic but rich forest types occur mostly on middle to upper gentle slopes, or well-drained flat terrain with deep, medium-textured soil. Bigleaf maple, flowering dogwood and grand fir are generally present. In the understorey, the shrub layer is similar to those on Douglas-fir-Salal sites, but honeysuckle and snowberry are absent. Sword fern is relatively frequent and bracken may also occur. Palm tree moss is a common indicator of relatively rich, moist site series (also found in 06). Younger stands have denser canopies due to the varying shade tolerance of the component species and sparse understories until canopy breakup occurs later in structural stage 5. These sites were frequently cleared in lowland sites and glaciomarine material to support orchards and pastures.</p> <p>There is a high potential for this ecosystem to contain the red-listed plant community (grand fir / dull Oregon-grape), which is associated with site series 04 in the CDFmm. This ecosystem type was mapped throughout Ruckle and Beaver Provincial Parks and the Cusheon Cove Addition, as well as the section of Mt. Tuam Ecological Reserve, Mt. Maxwell Ecological Reserve and Burgoyne Bay Provincial Park.</p>		<p>Elevation (m): <150 Slope (%): 0-20 (<35) Aspect (°): variable Surficial material: W^G, M Drainage: w SMR: 2-4 SNR: D-E</p>
Assumed modifiers: d, j, m		Atypical site modifiers: h, k, r, s, v, w, x
	<p>Ecosystem Polygons with DG Mapped within BC Parks (indicated in dark green)</p> 	


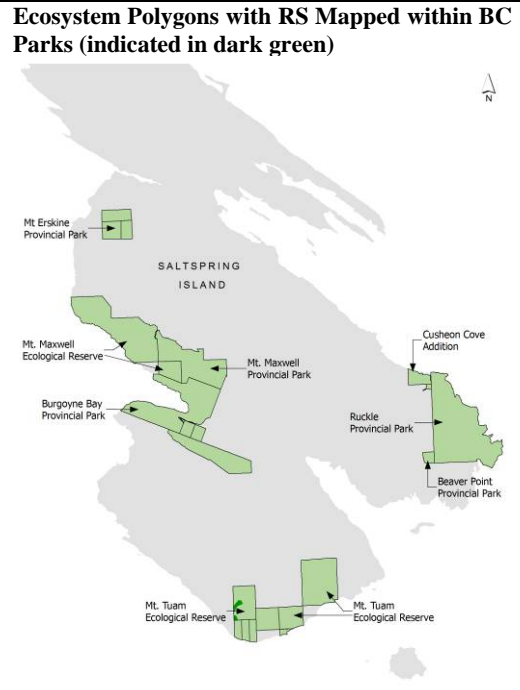
TEM Code	Site Association	Site Series
CDFmm - DO	Douglas-fir—Oniongrass	03
<p>Site Description</p> <p>This site series predominates in rich to very rich xeric to subxeric sites (crests to upper slopes) where bedrock lies at or near the surface. It often forms mosaics with herbaceous meadows containing Garry oak where soils are richer, sites that support high plant, vertebrate and invertebrate diversity.</p> <p>The tree layer is dominated by Douglas-fir; Garry oak is present on warm aspects with mull humus forms; arbutus is typically the only other tree species. On cool aspects, this ecosystem type is less abundant, often displaced or occurring together with Douglas-fir—Grand fir—Oregon grape forests. The shrub layer is sparse with small amounts of snowberry, hairy honeysuckle, oceanspray, and regenerating the overstorey species.</p> <p>The herb layer is diverse, but spring sampling will typically yield the highest diversity of species, particularly rare species. Common herbs include Alaska oniongrass, large-leaved sandwort, broad-leaf shootingstar, nodding trisetum and Pacific sanicle. Shootingstar species, montane violet, and brodiaea and other members of the Liliaceae are less frequent. The bryophyte layer is dominated by electrified cat’s-tail moss with a small component of Oregon beaked moss. On rocky microsites, Racomitrium and Dicranum species are common.</p> <p>There is a high potential for this ecosystem to contain the red-listed plant community (Douglas-fir / Alaska Oniongrass), which is associated with site series 03 in the CDFmm.</p>		<p>Elevation (m): <500 Slope (%): 15-50 Aspect (°): 100-250 Surficial material: W^G, M Drainage: r-w SMR: 0-1 SNR: D-E</p>
Assumed modifiers: d, m, r		Atypical site modifiers: k, r, s, v, w, x
	<p>Ecosystem Polygons with DO Mapped within BC Parks (indicated in dark green)</p> 	

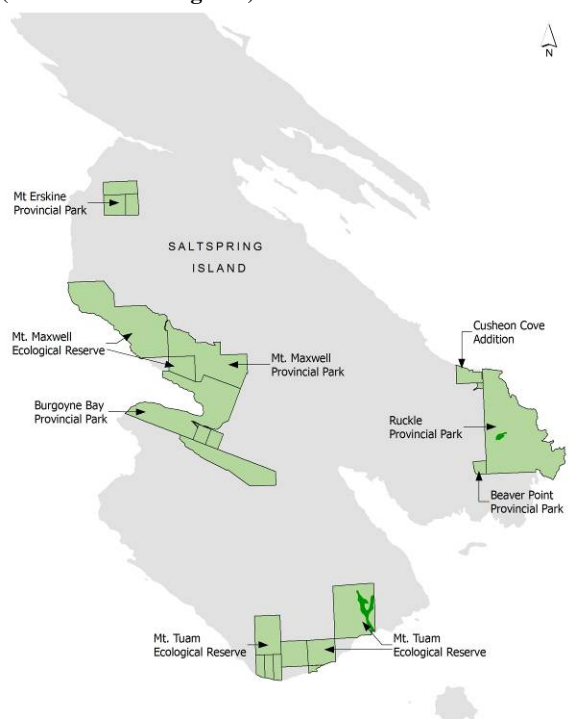
TEM Code	Site Association	Site Series
CDFmm - DS	Douglas-fir—Salal	01
<p>Site Description</p> <p>This zonal ecosystem type is found most often on sites with medium (mesic) soil nutrient regimes, also occurring on lower slopes with drier or poorer characteristics that receive moisture and nutrient inputs from higher upslope. Zonal sites receive and shed an equivalent amount of moisture, and are found in middle to upper slopes with relatively gentle topography. Soils on these sites in the study are typically medium to coarse textured and well-drained. Soils derived from till have more coarse fragments and more clay than those derived from glaciomarine or outwash deposits. Soils in this ecosystem type overlie bedrock or other surficial material in mantles of variable thickness and are moderately well to well-drained.</p> <p>Forests are generally open with 30-50% canopy closure. Human modification via various logging regimes and fire suppression has resulted a landscape dominated by earlier successional forests with denser canopies (largely structural stages 5 and 4). Douglas-fir in these sites is susceptible to phellinus root rot and, to a lesser degree, armillaria. These pathogens are naturally present in varying concentrations across the native range of Douglas-fir. From an ecosystem management perspective, they provide an ongoing source of woody debris, diversify the stand structure, and shift species composition to favour alternative species such as hardwoods.</p> <p>There is a high potential for this ecosystem to contain the red-listed plant community (Douglas-fir / dull Oregon-grape), which is associated with site series 01 in the CDFmm. A draft element occurrence specifications report (2006) exists for the identification of this rare plant community (request from BC Conservation Data Centre).</p>		<p>Elevation (m): <400 m Slope (%): variable Aspect (°): variable Surficial material: M, W^G, C Drainage: w SMR: 2-4 SNR: A-C</p>
Assumed modifiers: d, j, m		Atypical site modifiers: g, h, k, q, r, s, v, w, x, y, z
	<p>Ecosystem Polygons with DS Mapped within BC Parks (indicated in dark green)</p> 	

TEM Code	Site Association	Site Series
CDFmm - RF	Western redcedar—Grand fir—Foamflower	06
<p>Site Description</p> <p>These rich and productive forest ecosystems are found in similar terrain and slope positions to Western redcedar-Douglas-fir-Oregon beaked moss associations (gentle lower slopes and moisture receiving sites), but soils tend to be deeper and richer, with a higher proportion of fines (e.g., loamy silt, silty clay loam). Tree species composition and abundance is similar to Douglas-fir-Grand fir-Oregon grape associations, with slightly more frequent flowering dogwood and less frequent bigleaf maple and grand fir, whose shallow roots are not well adapted to hygric soil moisture regimes. Forest canopies have higher closure with moderately abundant western redcedar regeneration in all canopy layers, with few shade-tolerant shrubs and herbs persisting in the understorey. The major understorey components are sword fern, bracken fern and dull Oregon grape, with small amounts of salal (absent from hygric sites) and vanilla-leaf. The most common mosses in these forest types are electrified cat's tail moss, Oregon beaked moss, step moss and palm tree moss.</p> <p>These sites have typically been altered in the study area (Burgoyne Bay Provincial Park) to support cultivated fields which may be seasonally flooded. Another small patch was mapped in Ruckle Provincial Park (northeastern boundary) and along the south end of Salt Spring Island in the Crown Lands assessment areas adjacent to Mt. Tuam. There is a high potential for this ecosystem to contain the red-listed plant community (grand fir / three-leaved foamflower), which is associated with site series 06 in the CDFmm.</p>		<p>Elevation (m): 0-250 m Slope (%): 0-35 Aspect (°): variable Surficial material: W^G, M Drainage: m SMR: 5-6 SNR: D-E</p>
Assumed modifiers: d, j, m		Atypical site modifiers: h, k, s, w
	<p>Ecosystem Polygons with RF Mapped within BC Parks (indicated in dark green)</p> 	


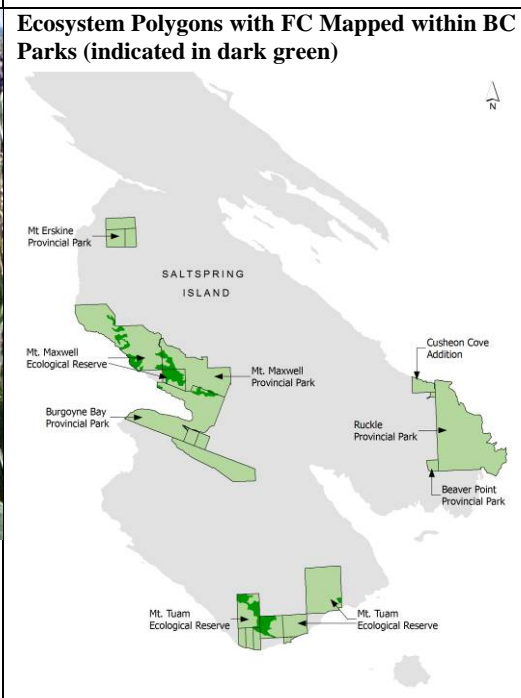
TEM Code	Site Association	Site Series
CDFmm - RK	Western redcedar—Douglas-fir—Oregon beaked moss	05
<p>Site Description</p> <p>These nutrient poor to mesotrophic forested ecosystems have subhygric to hygric moisture regimes, and are typically situated on lower gentle sloping (moisture receiving) sites. Soils are typically deep and often imperfectly to moderately well drained, but these forests may occur on shallow soils in lower and toe slopes, particularly on cooler aspects. Trees other than Douglas-fir and western redcedar are typically absent; where management has resulted in changes to the hydrological regime, off-site Douglas-fir can be observed experiencing stress and mortality due to high water tables. The shrub layer on these sites is dominated by salal and dull Oregon grape, with incidental amounts of baldhip rose and ocean spray, most often on raised hummocks. Sword fern and bracken fern are present, with vanilla-leaf. Step moss and Oregon beaked moss are the major bryophytes.</p> <p>There is a high potential for this ecosystem to contain the red-listed plant community (Western redcedar-Douglas-fir-Oregon beaked moss), which is associated with site series 05 in the CDFmm.</p>		<p>Elevation (m): <350 Slope (%): 0-50 Aspect (°): variable Surficial material: M, W^G (C) Drainage: w-m SMR: 5-6 SNR: A-C</p>
Assumed modifiers: d, j, m		Atypical site modifiers: g, k, h, n, s, v, w, y, z
	<p>Ecosystem Polygons with RK Mapped within BC Parks (indicated in dark green)</p>  <p>The map shows Salt Spring Island with several parks and reserves marked. Dark green polygons indicate mapped areas for the ecosystem. The locations are: Mt. Erskine Provincial Park, Mt. Maxwell Ecological Reserve, Burgoyne Bay Provincial Park, Mt. Maxwell Provincial Park, Ruckle Provincial Park, Beaver Point Provincial Park, Mt. Tuam Ecological Reserve, and Mt. Tuam Ecological Reserve. A north arrow is present in the top right corner of the map area.</p>	

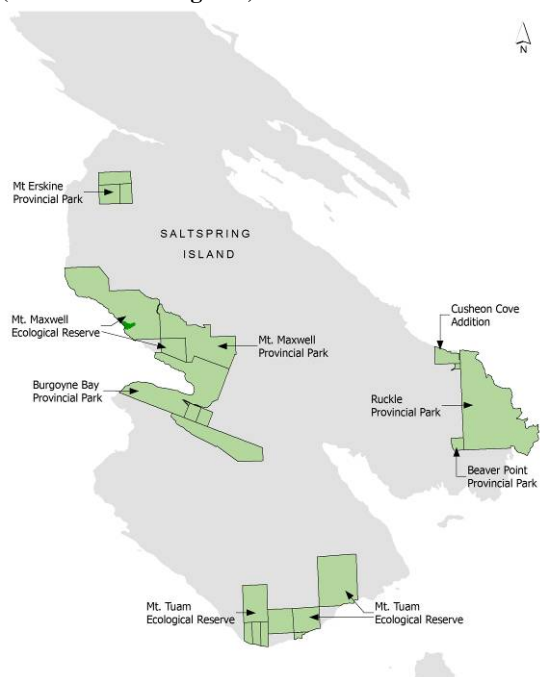
TEM Code	Site Association	Site Series
CDFmm - RP	Western redcedar—Indian-plum	13
<p>Site Description</p> <p>These rich, hygric (summer fresh/winter wet) forests have fluctuating water tables, indicated by mottled soil horizons, or infrequently gleyed soil types. These forests are dominated by redcedar and red alder, with infrequent Douglas-fir and more, with hardwood cover predominating on disturbed sites. The high water table limits rooting depth and soil bearing strength, causing individual trees to fall over and expose mineral soil seedbeds ideal for red alder. These forests have moderately abundant berry-producing shrubs indicative of richer sites and pH approaching neutral (5.5-7.0) (e.g., trailing blackberry, salmonberry). Salal, ocean spray, and other indicators of lower pH and nitrogen availability are absent. The herb layer is relatively sparse, reflecting the high canopy light interception by the dense forest canopy; shade-tolerant sword fern and foamflower are the most common species. Ephemeral herbs may also occur.</p> <p>Moss cover is relatively high, dominated by Oregon slender moss with lesser amounts of the mosses found in Western redcedar—Vanilla leaf sites. These sites are often converted in glaciomarine sediments (i.e., Ruckle Provincial Park) to seasonally flooded fields. It was also mapped in the eastern section of Mt. Tuam Ecological Reserve. There is a high potential for this ecosystem to contain the red-listed plant community (western redcedar-Indian plum), which is associated with site series 13 in the CDFmm.</p>		<p>Elevation (m): <350 Slope (%): <35% Aspect (°): variable Surficial material: M, W^G Drainage: i SMR: 6 SNR: D</p>
Assumed modifiers: d, j, m		Atypical site modifiers: h, k, s, w
	<p>Ecosystem Polygons with RP Mapped within BC Parks (indicated in dark green)</p> 	


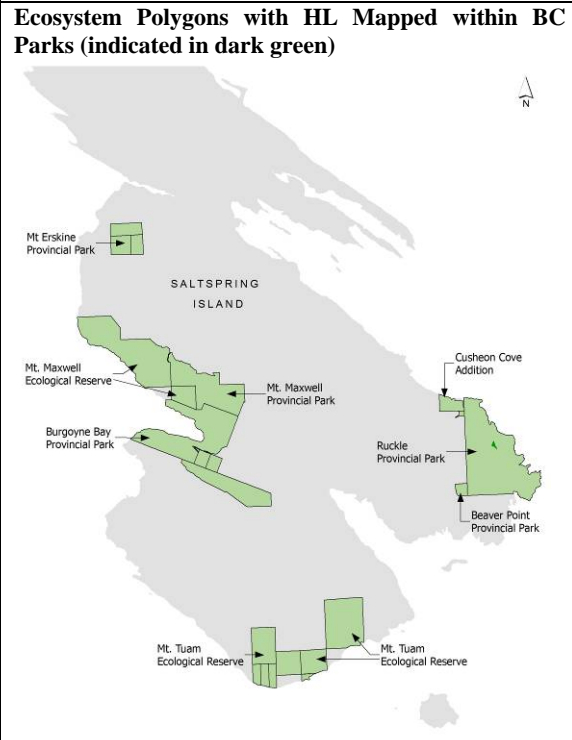
TEM Code	Site Association	Site Series
CDFmm - RS	Western redcedar—Snowberry	07
<p>Site Description</p> <p>This site series indicates high bench floodplains. The moderately well-sorted deep fluvial deposits upon these sites are moderately well to well drained. Forests are seasonally inundated and harbour species adapted to periodic flooding or high water tables. Western redcedar is the most frequent conifer, red alder and bigleaf maple frequent components, and black cottonwood less frequent. Shrubs include snowberry, salmonberry, stink currant and red elderberry. Typical herb species are false Solomon’s seal, false lily-of-the-valley, vanilla-leaf, lady fern and three-leaved foamflower. Mosses are dominated by coastal leafy moss with Menzies’ tree moss and small amounts of Oregon slender moss.</p> <p>This ecosystem was only mapped within the Mt. Tuam Ecological Reserve (western section). There is a high potential for this ecosystem to contain the red-listed plant community (western redcedar / common snowberry), which is associated with site series 07 in the CDFmm.</p>		<p>Elevation (m): 50-150 Slope (%): 0-35 Aspect (°): variable Surficial material: F Drainage: m SMR: 5-6 SNR: D-E</p>
Assumed modifiers: a, d, j, m		Atypical site modifiers: g, k, s, w
	<p>Ecosystem Polygons with RS Mapped within BC Parks (indicated in dark green)</p> 	


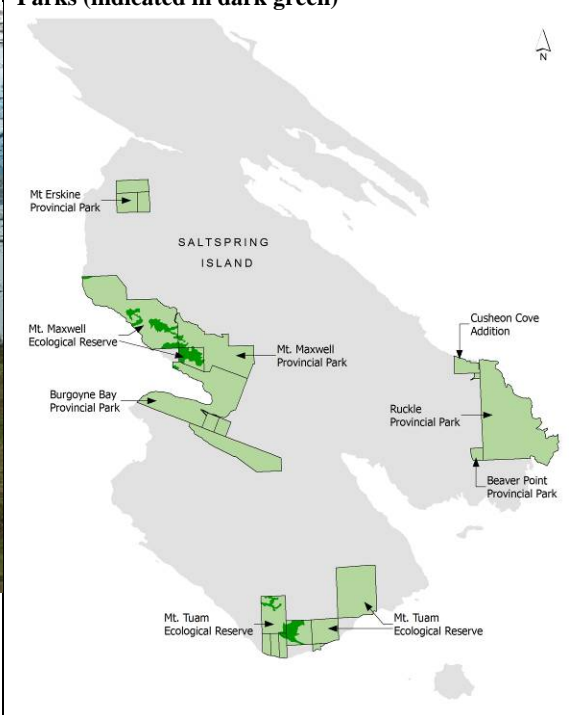
TEM Code	Site Association	Site Series
CDFmm - RV	Western redcedar—Vanilla-leaf	12
<p>Site Description</p> <p>These nutrient-rich, diverse forests are located on lower gentle slopes and are characterized by fluctuating water tables (summer slightly dry/winter very moist) that are more well-drained than Western redcedar—Indian-plum sites (moderately well to imperfectly drained). Soils are deep and medium textured, but could have a root restricting soil horizon/lithic contact or be adjacent to a seepage or riparian site, leading to the development of this ecosystem type on shallower soils or more sloping terrain than typical. The soil texture and seasonally high water table make these sites susceptible to disturbance via soil compaction. The tree canopy is patchy and dense with gaps, including major components of grand fir, bigleaf maple, red alder, and some flowering dogwood and Douglas-fir on elevated microsites. Shrubs are primarily shade-tolerant (e.g., salal, dull Oregon-grape, snowberry) but some less tolerant species also occur in gaps (e.g., ocean spray). Sword fern is frequently abundant, with vanilla-leaf and foamflower the most common associates; the herb layer varies considerably with canopy closure. The bryophyte layer features mosses such as Oregon beaked moss, Oregon slender moss, and Menzies’ tree moss.</p> <p>This ecosystem was mapped in Ruckle Provincial Park and Mt. Tuam Ecological Reserve. There is a high potential for this ecosystem to contain the red-listed plant community (western redcedar / vanilla leaf), which is associated with site series 12 in the CDFmm.</p>		<p>Elevation (m): 20-200 Slope (%): 0-35 Aspect (°): variable Surficial material: W^G, M (F) Drainage: m SMR: 5 SNR: C</p>
Assumed modifiers: d, j, m		Atypical site modifiers: h, k, s
No photo available	<p>Ecosystem Polygons with RV Mapped within BC Parks (indicated in dark green)</p> 	


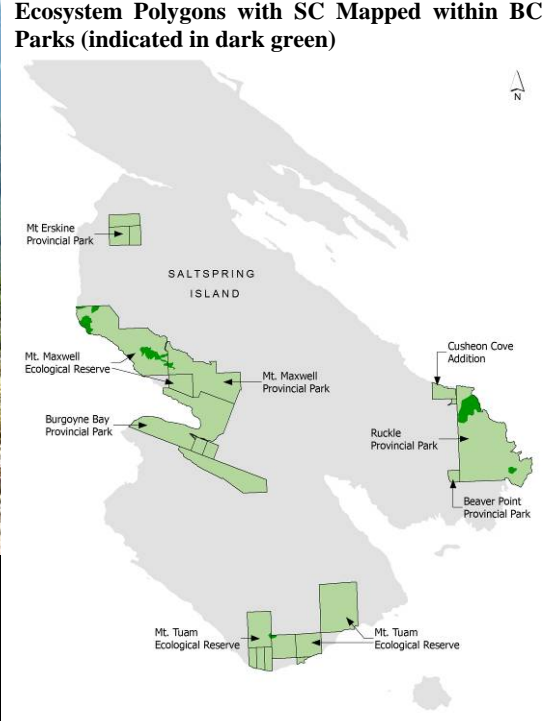
3.2.2 CDFmm – Non-forested and Sparsely Vegetated Ecosystems

TEM Code	Site Association	Site Series
CDFmm - FC	Fescue—Camas	00
<p>Site Description</p> <p>Fescue—Camas herbaceous meadows, or herbaceous meadows containing varying proportions of these species along with others (but not distinguishable from slightly differing herbaceous communities on an air photo) were moderately frequent, typically on gentle to moderately sloping, warm aspects with soils of varying depth. This site series has many of the same herbaceous species as the Douglas-fir—Oniongrass ecosystem type when Garry oak is present (CDFmm/03:B). Herbaceous and bryophyte cover is nearly total; shrubs were infrequent. Common snowberry, Nootka rose, ocean spray and invasive species (e.g., Scotch broom) were the most common shrubs. Trees were sparse and shrubby in habit, covering 0-2% of the site, typically Garry oak, arbutus, and/or Douglas-fir which may also be present as scattered veterans on site. Herbaceous species presence varied with distance from disturbance: sites near roads and pastures frequently contained a high proportion of invasive perennial grasses such as early hairgrass, orchardgrass, Kentucky bluegrass, and many others. Even sites relatively removed from disturbance often contained at least some of these species.</p> <p>Native species included camas species, western and Roemer’s fescue, Pacific sanicle, Alaska oniongrass, brodiaea species, Lomatium species, and others, which varied by season and among sites. Bryophytes and lichens were not abundant; Racomitrium moss and Wallace’s selaginella occasionally colonized bedrock outcrops. Yellow and pink monkeyflowers typically indicated seepage areas.</p>		<p>Elevation (m): 0-550 Slope (%): 15-55 Aspect (°): 135-275 Surficial material: C, M, W^G Drainage: r-x SMR: 2 SNR: C-E</p>
Assumed modifiers: j, m, s		Atypical site modifiers: k, w, v
	<p>Ecosystem Polygons with FC Mapped within BC Parks (indicated in dark green)</p> 	


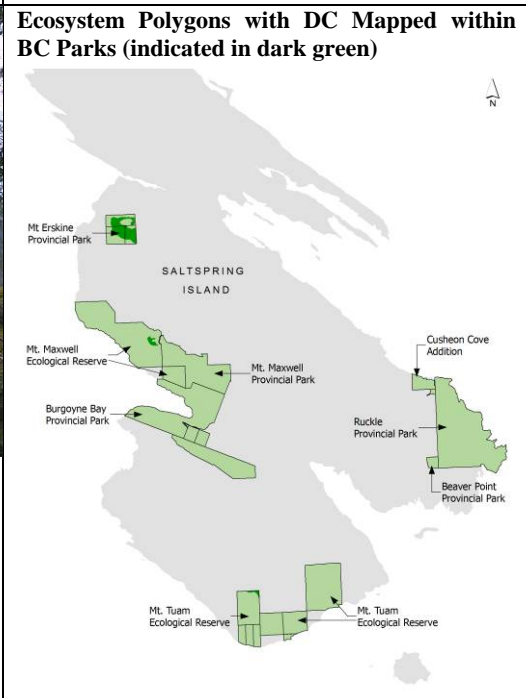
TEM Code	Site Association	Site Series
CDFmm - GO	Garry oak—Oceanspray	00
<p>Site Description</p> <p>These ecosystems occurred mostly on the southern slopes of Mount Maxwell in steep, south-facing, very rapidly drained thin colluvial material over bedrock. This ecosystem type was defined using a combination of information from Erickson and Meidinger (2007) and Madrone (2003) to determine the site attributes typical for this community. Wetter, cool-aspect sites classified by Erickson and Meidinger (2007) were not mapped on Salt Spring Island. Sites dominated by shrubs and Garry oak with a relatively contiguous herbaceous layer were mapped as GO, although species composition varied.</p> <p>Within the BC Parks study areas, this ecosystem unit was only mapped within Mount Maxwell Ecological Reserve. It is likely that any polygons mapped as this unit are the red-listed rare plant community Garry oak-Oceanspray.</p>		<p>Elevation (m): 50-500 Slope (%): 40-100 Aspect (°): 135-270 Surficial material: C, R Drainage: x SMR: 1-2 SNR: B</p>
Assumed modifiers: j, m, r		Atypical site modifiers: s, v, w, z
No photo available	<p>Ecosystem Polygons with GO Mapped within BC Parks (indicated in dark green)</p> 	


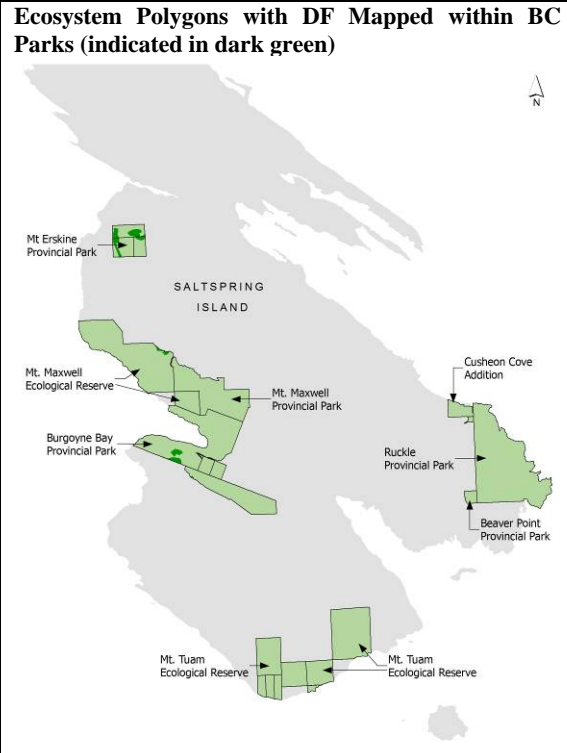
TEM Code	Site Association	Site Series
CDFmm - HL	Hardhack—Labrador tea	00
<p>Site Description</p> <p>These sites were very infrequent in the study area and occupied small areas, most often characterized by organic sediments of variable thickness. The shrubby, acidic, nutrient-poor fens were very poorly drained. Low shrubs dominated, with taller shrubs (3-4 m) around the margins of the wetlands. Species diversity was low, with hardhack often the most abundant, and lesser amounts of red-osier dogwood, willow, and only rarely Labrador tea occurring, typically along the margins. Herbaceous vegetation was sparse to absent due to anoxic conditions and standing water.</p> <p>This ecosystem was uncommon within the study area, and was only mapped within Ruckle Provincial Park.</p>		<p>Elevation (m): 0-250 Slope (%): 0 Aspect (°): n/a Surficial material: O Drainage: p SMR: 7 SNR: B</p>
Assumed modifiers: d, j, p		Atypical site modifiers: none
	<p>Ecosystem Polygons with HL Mapped within BC Parks (indicated in dark green)</p> 	


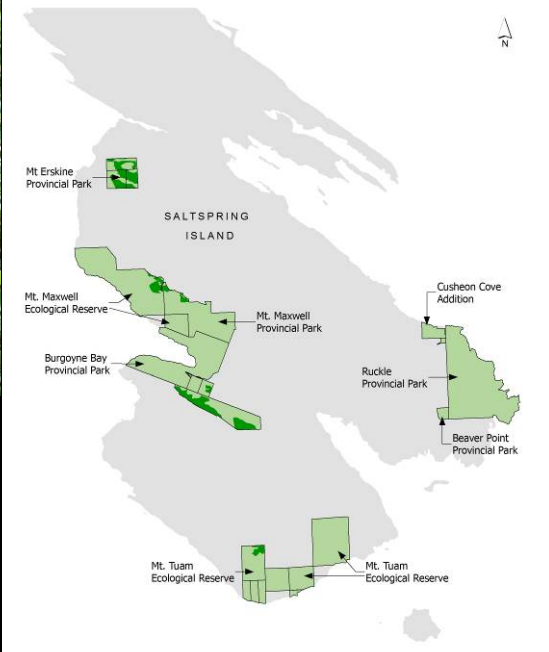
TEM Code	Site Association	Site Series
CDFmm - QB	Garry oak—Brome/mixed grasses	00
<p>Site Description</p> <p>These sites correspond with the associations proposed by Erickson and Meidinger (2007) where the overstorey is sparse and consisting solely of Garry oak, and the understorey includes graminoids and forbs over shallow or very shallow soils on warm aspects. It resembles the Fescue—Camas association, but with a substantial component of Garry oak, and lacking in most of the diagnostic species that characterize the Douglas-fir—Oniongrass association. The composition of the herbaceous layer varies with surficial material and thickness, slope, and drainage: relatively mesotrophic sites contain mixtures of graminoids and forbs, while richer sites have fewer graminoids and more ephemeral species found in drier Garry oak meadows, including members of the Liliaceae and yellow montane violet.</p> <p>These sites are sensitive, have the potential to contain rare fauna and flora, and are susceptible to disturbance via invasive species, soil displacement, and habitat displacement. They were mapped most frequently on the southern slopes of Mt. Tuam Ecological Reserve, adjacent Crown Land parcels and Mt. Maxwell Ecological Reserve and Provincial Park. It is safe to assume that wherever this ecosystem has been mapped, it is considered to be a red-listed rare plant community by the Conservation Data Centre of BC. Many red and blue-listed plants and animals are found in this rare Garry oak habitat.</p>		<p>Elevation (m): 20-550 Slope (%): 20-50 Aspect (°): 15-260 Surficial material: R, C (M) Drainage: r-x SMR: 1-2 SNR: B</p>
Assumed modifiers: j, m, r		Atypical site modifiers: k, s, v, w
	<p>Ecosystem Polygons with QB Mapped within BC Parks (indicated in dark green)</p> 	


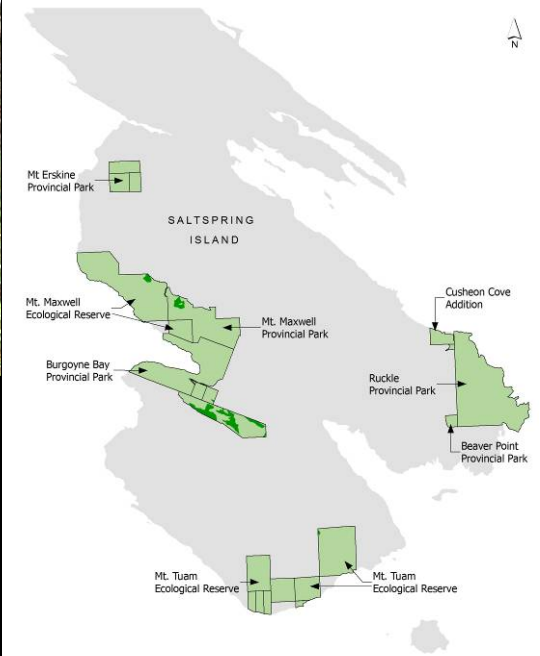
TEM Code	Site Association	Site Series
CDFmm - SC	Cladina—Wallace’s selaginella	00
<p>Site Description</p> <p>These sites were most often found on very to extremely shallow soils and rocky outcrops. Low water-holding capacity of sites, which occasionally consisted of extremely thin veneers and thin veneers of till or glaciomarine material, supported this plant community which also thrived on bare rock. This association probably can be subdivided into several associations. supported a range of non-vascular flora, including lipstick cladonia, pixie cup, hoary and common rock moss, sidewalk moss, and Wallace’s selaginella. Field inspection revealed this community varied to include components of diverse vascular species such as stonecrops, and frequently contained low to moderate cover of introduced grass species on richer sites. Herbaceous species more typical of richer sites were noted in depressional microsities and crevices, such as brodiaea and, common camas; monkeyflower species were infrequent in seepage sites.</p>		<p>Elevation (m): 0-550 Slope (%): 0-100 Aspect (°): 135-285 (varies) Surficial material: R (Mx, W^Cx) Drainage: x SMR: 0-1 SNR: A-B</p>
Assumed modifiers: j, m, r, v		Atypical site modifiers: k, s, w, z
	<p>Ecosystem Polygons with SC Mapped within BC Parks (indicated in dark green)</p> 	


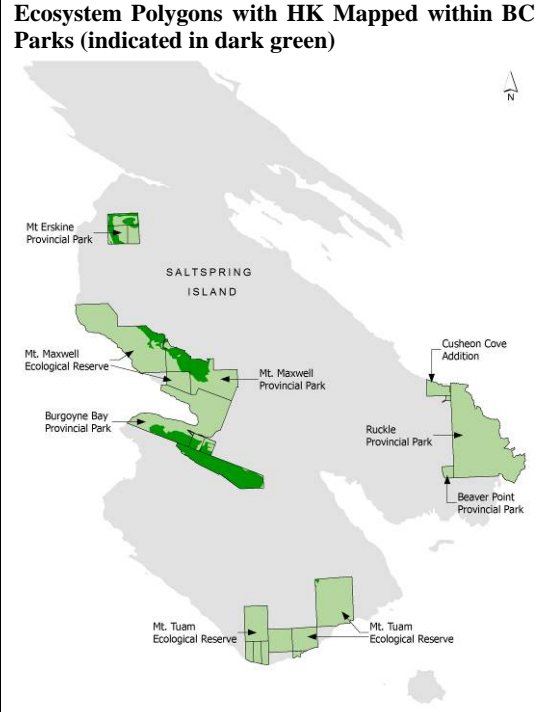
3.2.3 CWHxm1 - Forested Ecosystems


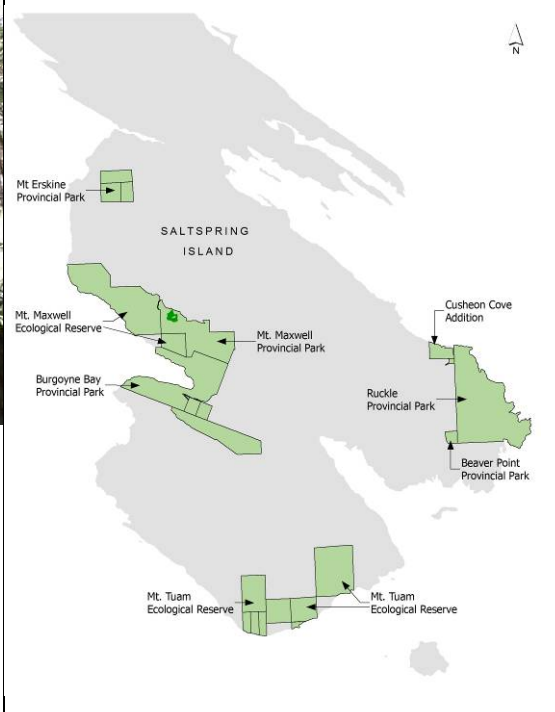
TEM Code	Site Association	Site Series
CWHxm1 - DC	Douglas-fir—Lodgepole pine—Cladina	02
<p>Site Description</p> <p>This site series was infrequently mapped, generally occurring on water-shedding very xeric ridge crests, and convex upper slopes with very thin soils, often with bedrock outcrops and mor humus forms, indicating very poor to poor nitrogen status. Canopy cover was sparse (20-40%), with much of the forest floor exposed. Shrubs included oceanspray, salal, red huckleberry, common snowberry, tall Oregon-grape, and honeysuckle species. Herb cover was sparse to nil during winter when sites were surveyed.</p> <p>Rocks and substrate were often covered by cladina lichen species and mosses including step moss, Oregon beaked moss, electrified cat’s tail moss, and pipecleaner moss, all indicators of nutrient-limited sites. These sites are highly susceptible to disturbance due to their fragile soils and thin humus layers. They were mapped most often in Mt. Erskine Provincial Park.</p>		<p>Elevation (m): 250-650 Slope (%): 5-65 Aspect (°): variable Surficial material: M Drainage: r SMR: 0 SNR: A (-B)</p>
Assumed modifiers: d, j, m		Atypical site modifiers: h, k, q, r, s, v, w, z
	<p>Ecosystem Polygons with DC Mapped within BC Parks (indicated in dark green)</p> 	


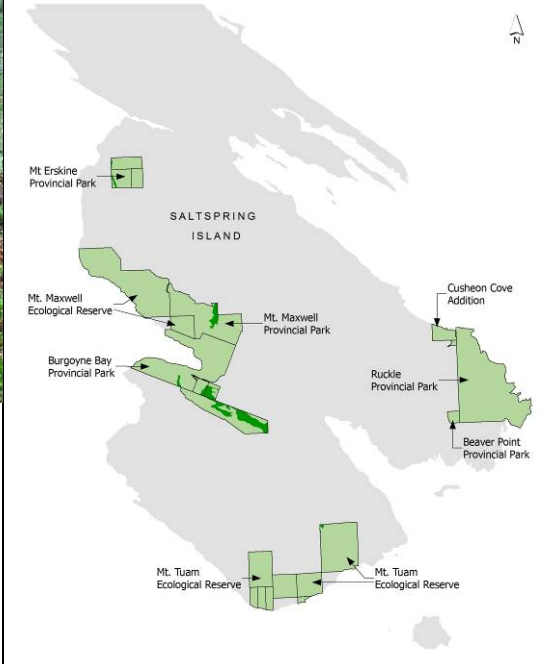
TEM Code	Site Association	Site Series
CWHxm1 - DF	Douglas-fir—Sword fern	04
<p>Site Description</p> <p>These ecosystems occurred on well drained upper to mid-slopes with variable thicknesses of till, typically of finer texture than sites supporting Douglas-fir—Western hemlock—Salal ecosystems. Humus forms were mulls to moders. Douglas-fir was most common in the canopy layer, but western hemlock was a frequent associate in all canopy layers. Grand fir was infrequent on these sites in the study area. Shrubs occupied low to moderate cover, with the major species dull Oregon-grape, red huckleberry, common snowberry, and trailing blackberry. Sword fern occupied much of the herb layer, with relatively few other species observed during winter sampling. The bryophyte layer was dominated by Oregon beaked moss. They were mapped on slopes of Mount Maxwell Ecological Reserve, Burgoyne Bay Provincial Park, and Mount Erskine.</p> <p>There is a high potential for this ecosystem to contain the red-listed plant community (Douglas-fir / sword fern), which is associated with site series 04 in the CWHxm1.</p>		<p>Elevation (m): 140-575 Slope (%): 35-55 Aspect (°): variable Surficial material: M Drainage: w SMR: 1-2 SNR: C-E</p>
Assumed modifiers: d, j, m		Atypical site modifiers: h, k, q, s, w, z
	<p>Ecosystem Polygons with DF Mapped within BC Parks (indicated in dark green)</p> 	

TEM Code	Site Association	Site Series
CWHxm1 - DS	Douglas-fir—Western hemlock—Salal	03
<p>Site Description</p> <p>These forested sites occurred on well-drained, nutrient very poor-to-medium upper slopes with mor humus types. Substrate was generally till of various depths. The canopy closure of younger stands was dense, opening up with succession. Regeneration of hemlock tended to be abundant in the understorey, with little Douglas-fir regeneration. Salal formed dense thickets, with little other plant cover and often some red huckleberry.</p> <p>This ecosystem unit was commonly found throughout Mt. Erskine Provincial Park. Many of these mapped sites show evidence of past harvesting (i.e., Mt. Erskine Provincial Park, Burgoyne Bay Provincial Park additions and Mt. Tuam Ecological Reserve). There is a high potential for this ecosystem to contain the blue-listed plant community (Douglas-fir - western hemlock / salal), which is associated with site series 03 in the CWHxm1.</p>		<p>Elevation (m): 130-600 Slope (%): 5-100 Aspect (°): variable Surficial material: M (C) Drainage: w-r SMR: 1-2 SNR: A-C</p>
Assumed modifiers: d, j, m		Atypical site modifiers: h, k, q, r, s, v, w, x, y, z
	<p>Ecosystem Polygons with DS Mapped within BC Parks (indicated in dark green)</p> 	


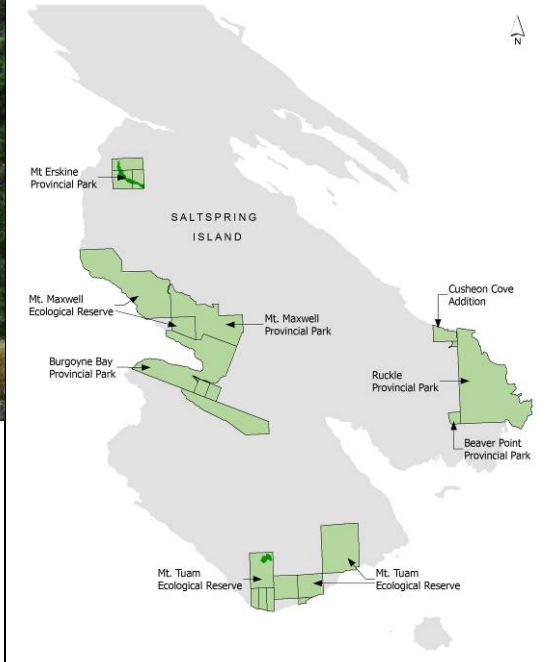
TEM Code	Site Association	Site Series
CWHxm1 - HD	Western hemlock—Western redcedar—Deer fern	06
<p>Site Description</p> <p>This site series was most frequent on north-facing mid to lower slopes with moderately to imperfectly drained soils derived from till. Western hemlock was the most abundant tree, with lesser amounts of western redcedar and grand fir. Bigleaf maple and red alder were often present in seral and disturbed stands. Deer fern (a diagnostic species for this association) was very infrequent on Salt Spring Island. The understorey featured salal, salmonberry, and dull Oregon-grape in the shrub layer, with sword fern, bracken, occasionally spiny wood fern, and introduced grass species in the herb layer. The moss layer contained primarily Oregon beaked moss with lesser amounts of curly heron’s bill moss, knight’s plume, and coastal leafy moss on decaying wood.</p> <p>Historic logging was relatively common in this forested ecosystem. The HD (06 site series) was mapped most often in the study area on the lower north-facing slopes of Burgoyne Bay Provincial Park Addition. Large patches of this ecosystem were also mapped in Mt. Maxwell Provincial Park and Ecological Reserve. There is a high potential for this ecosystem to contain the red-listed plant community (western hemlock – western redcedar / deer fern), which is associated with site series 06 in the CWHxm1.</p>		<p>Elevation (m): 250-575 Slope (%): 15-45 Aspect (°): variable Surficial material: M Drainage: w-m SMR: 5-6 SNR: A-C</p>
Assumed modifiers: d, j, m		Atypical site modifiers: h, k, s, v, w
	<p>Ecosystem Polygons with HD Mapped within BC Parks (indicated in dark green)</p> 	

TEM Code	Site Association	Site Series
CWHxm1 - HK	Douglas-fir—Western Hemlock— Oregon beaked moss	01
<p>Site Description</p> <p>This is the zonal ecosystem that occurs on sites with medium (mesotrophic) soil nutrient regimes and mesic nutrient regimes, distributed throughout the parks in the CWHxm1. Soils originate from till, and infrequently from colluvium (on moisture-receiving sites), with good drainage (or moderate drainage on colluvial veneers). Seral or disturbed sites have high cover of Douglas-fir and red alder; the latter replaced by western hemlock with succession, but historically and currently disturbed sites tend to have more Douglas-fir than typical due to its higher value for timber and selective removal of other species. Hemlock regeneration can be extremely dense, with high canopy closure, on moister and more shaded sites, but again this varies with disturbance history. Shrubs are most often dominated by salal, with variable cover of salmonberry, dull (infrequently tall) Oregon-grape, red huckleberry, and trailing blackberry most typical. Herbs vary considerably with canopy closure and substrate, often containing sword fern and, less frequently, deer fern. Mosses are overwhelmingly dominated by Oregon beaked moss.</p> <p>These sites are almost entirely disturbed by logging over the past century. Some areas are supporting third-growth stands. Other forested ecosystems appear to host this plant association due to management described above; examination of soil horizons, humus forms, and mesoslope position is necessary to correctly identify these site types. There is a high potential for this ecosystem to contain the red-listed plant community (western hemlock – Douglas-fir / Oregon beaked-moss), which is associated with site series 01 in the CWHxm1.</p>		<p>Elevation (m): 120-600 Slope (%): 0-100 Aspect (°): variable Surficial material: M (C) Drainage: w SMR: 3-4 SNR: A-C</p>
Assumed modifiers: d, j, m		Atypical site modifiers: h, k, q, r, s, v, w, x, z
	<p>Ecosystem Polygons with HK Mapped within BC Parks (indicated in dark green)</p>  <p>The map shows Salt Spring Island with several parks and reserves marked. Dark green polygons indicate the presence of the HK ecosystem. These include Mt. Erskine Provincial Park, Mt. Maxwell Ecological Reserve, Burgoyne Bay Provincial Park, Mt. Maxwell Provincial Park, Ruckle Provincial Park, Beaver Point Provincial Park, Mt. Tuam Ecological Reserve, and Mt. Tuam Ecological Reserve. Other parks shown in light green include Cusheon Cove Addition and Ruckle Provincial Park.</p>	

TEM Code	Site Association	Site Series
CWHxm1 - RF	Western redcedar—Foamflower	07
<p>Site Description</p> <p>These ecosystems occurred on moisture-receiving toe slopes, some seepage sites (depending on the extent of hydrological influence, soil nutrient status, and topography), and level sites with thick relatively rich, moderately well to imperfectly drained soils. Material was derived from till or outwash. Humus forms included moders to mulls. Redcedar was often associated in the semi-open canopy with grand fir and bigleaf maple; Douglas-fir was infrequent to absent on most sites. Trees on these productive sites tended to be larger than their cohorts in most other site series. Shrubs included dense cover of salmonberry and thimbleberry. Herbs also occupied a high cover proportion, with ladyfern, spiny wood fern, foamflower, vanilla-leaf, oak fern, and small-flowered rush typically present in varying amounts on most sites. Coastal leafy moss was frequent in the bryophyte layer, with lesser amounts of slender beaked moss.</p> <p>Many of these rich sites in gentle to flat terrain were cleared for rural usage and pasture, or disturbed due to logging. Only one area of significant size was mapped within the areas of study (in Mt. Maxwell Provincial Park). There is a high potential for this ecosystem to contain the red-listed plant community (western redcedar / three-leaved foamflower), which is associated with site series 07 in the CWHxm1.</p>		<p>Elevation (m): 120-325 Slope (%): 0-35 Aspect (°): variable Surficial material: M Drainage: m SMR: 5-6 SNR: D-E</p>
Assumed modifiers: d, j, m		Atypical site modifiers: h, k, s, w
	<p>Ecosystem Polygons with RF Mapped within BC Parks (indicated in dark green)</p> 	

TEM Code	Site Association	Site Series
CWHxm1 - RS	Western redcedar—Sword fern	05
<p>Site Description</p> <p>This somewhat infrequently occurring site series was mapped most often on north-facing mid-slopes with well to moderately well-drained soils derived from till and occasionally colluvium. Redcedar was not always dominant in the canopy, likely reflecting the disturbance history of sites in the study area. Western hemlock, grand fir, and Douglas-fir were also frequent in all canopy layers. Coarse woody debris was moderately abundant to abundant on most sites. The understorey featured salal, common snowberry, variable amounts of salmonberry, and occasionally dull Oregon-grape in the shrub layer, with sword fern, bracken, occasionally spiny wood fern, and introduced grass species in the herb layer.</p> <p>The moss layer contained primarily Oregon beaked moss with lesser amounts of curly heron’s bill moss, knight’s plume, and coastal leafy moss on decaying wood. Some sites were influenced by seepage, and developed on warm aspects or shallower soils than typical.</p> <p>Most of these ecosystems were mapped on the slopes of Burgoyne Bay Provincial Park, Mount Erskine Provincial Park, and Mount Maxwell Provincial Park and showed evidence of historic logging. Where mature forests of this type remain (structural stages 6 and 7; possibly structural stage 5 as well), they are likely to contain the blue-listed rare plant community (western redcedar / sword fern), which is associated with the 05 site series in the CWHxm1.</p>		<p>Elevation (m): 125-550 Slope (%): 10-100 Aspect (°): 285-135 (135-285) Surficial material: M, C Drainage: w-m SMR: 3-4 SNR: D (E)</p>
Assumed modifiers: d, j, m		Atypical site modifiers: h, k, q, s, v (w)
	<p>Ecosystem Polygons with RS Mapped within BC Parks (indicated in dark green)</p> 	

3.2.4 CWHxm1 – Non-forested and Sparsely Vegetated Ecosystems

TEM Code	Site Association	Site Series
AM	Arbutus—Hairy manzanita	00
<p>Site Description</p> <p>These very xeric, nutrient-poor sites occurred on ridge crests and water-shedding steep upper slopes directly on bedrock. Canopies were very open (<5%) with arbutus and occasionally shore pine, rarely reaching past structural stage 4 with respect to structural development features. The shrub layer was dominated by hairy manzanita, arbutus regeneration, and occasionally Scotch broom. Herbs were typically sparse, but annuals may be evident in the spring, particularly graminoids, but comprising low (<20%) cover. The substrate was typically covered in dicranum mosses and, to a lesser extent, foliose lichens.</p> <p>This ecosystem type was found in Mt. Erskine Provincial Park and Mt. Tuam Ecological Reserve. There is a high potential for this ecosystem to contain the red-listed plant community (Arbutus – Hairy manzanita), which is associated with ecosystem type in the CWHxm1.</p>		<p>Elevation (m): Slope (%): Aspect (°): 120-250 Surficial material: R Drainage: r SMR: 1 SNR: A</p>
Assumed modifiers: j, r, s		Atypical site modifiers: v, w, z
	<p>Ecosystem Polygons with AM Mapped within BC Parks (indicated in dark green)</p> 	

HL, SC – see description for CDFmm

3.2.5 Anthropogenic and sparsely vegetated sites

BE – Beach

This unit was only large enough as a polygon component to map within the Cusheon Cove Addition of Ruckle Provincial Park. It consists, by definition, of active marine sediments influenced by wave washing, differing from mudflats by the relatively coarse texture and moderate drainage.

CF – Cultivated field

Cultivated fields were mapped in Burgoyne Bay and Ruckle Provincial Parks, typically on thick, flat to very gently sloping, well to imperfectly drained glaciomarine deposits. These fields are hayed and/or used for pasture, rather than for intensive agricultural production. They are generally covered with a very high proportion of agronomic grasses and other invasive species.

Channelized waterbodies, ditches, and drainage tiles have altered the natural hydrology. Depending on the drainage, these fields or portions of them may be mapped in the Sensitive Ecosystem Inventory as seasonally flooded fields (secondary habitat types, rather than native sensitive ecosystems). Without management inputs, these mapped units would gradually revert to CDFmm/04 or CDFmm/06 on well to moderately well drained sites, and CDFmm/12, CDFmm/13, and CDFmm/14 on imperfectly drained sites.

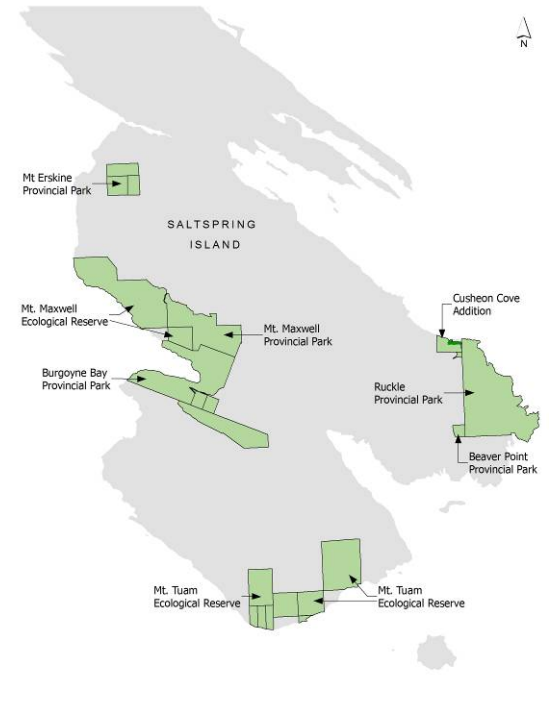
CL – Cliff

Cliffs were infrequently mapped, occurring on the steep southern aspects of Mt. Erskine Provincial Park and Mt. Maxwell Provincial Park. Due to parallax on air photos and geodetic projections of the spatial layers, the actual surface area covered by cliffs is actually larger than that mapped (i.e., air photos mapped from directly overhead do not accurately capture vertical distance and area of cliffs). These sites are categorized as sensitive ecosystems, and often contain uncommon or rare plant species in crevices and seeps. Some wildlife species, such as the federally threatened Peregrine Falcon (*anatum* subspecies), also utilize some cliffs for habitat, but typically require caves with overhanging entrances and outward-sloping floors (White et al. 2002), which were not found on Salt Spring Island.

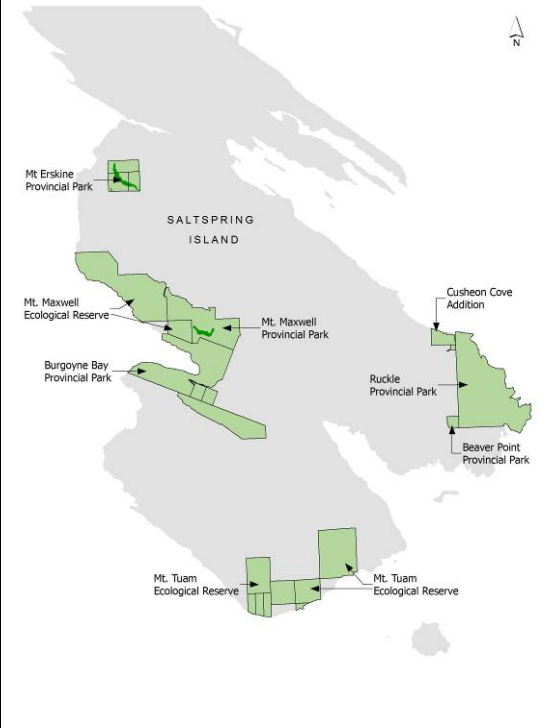
CO – Cultivated orchard

The orchards in Ruckle Provincial Park constituted a large enough proportion of the polygon to be included in the label. Although they support entirely agronomic species, wildlife usage of these polygons is high, particularly for birds, deer, and herbivorous mammals from mice to raccoons.

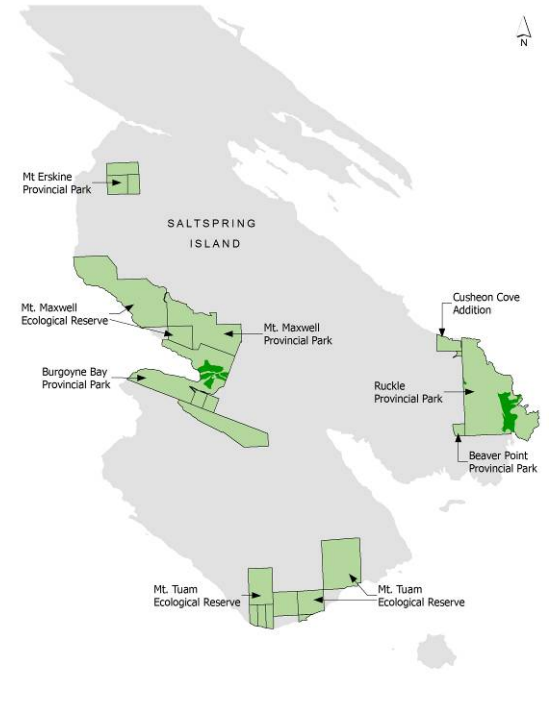
Ecosystem Polygons with BE Mapped within BC Parks (indicated in dark green)



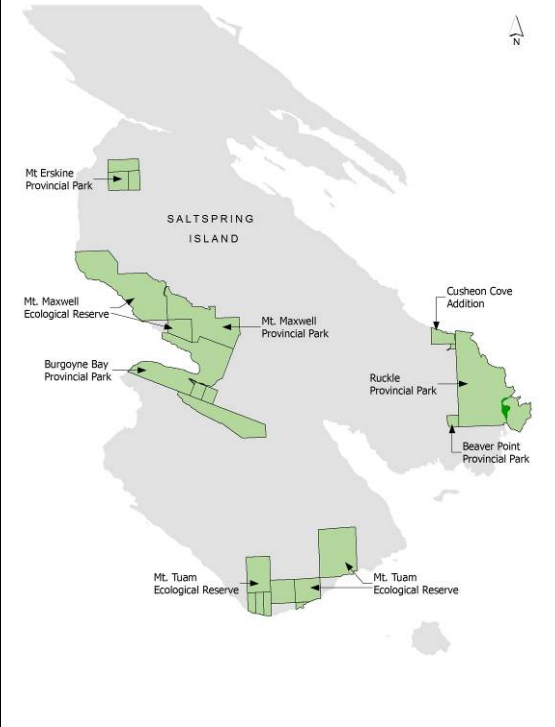
Ecosystem Polygons with CL Mapped within BC Parks (indicated in dark green)



Ecosystem Polygons with CF Mapped within BC Parks (indicated in dark green)



Ecosystem Polygons with CO Mapped within BC Parks (indicated in dark green)



ES – Exposed soil

Exposed soil polygons were mapped where air photos or site observations showed recently disturbed bare soils. These are only temporally transient map units and most often will either be developed to support rural residential, roads, or regenerate to forests. Erosion may be a concern, depending on slope gradient, soil texture, proximity of water bodies, site and slope hydrological characteristics, and size of the polygon.

GP – Gravel pit

Quarries and gravel pits were only mapped at Burgoyne Bay Provincial Park. This site was also colonized by invasive species, as were many of the disturbed and anthropogenic map units.

RO – Rock outcrop

Rock outcrops were mapped where bare or sparsely vegetated rocks occupy the surface and the slope is <100% (where the unit becomes classified as a cliff). These were mapped predominantly at Ruckle Provincial Park along the shoreline. Plants growing within rock crevices may be ephemeral species, easily damaged by trampling. Rocks entirely covered by bryophytes or cryptogams are mapped as Selaginella–Cladina units.

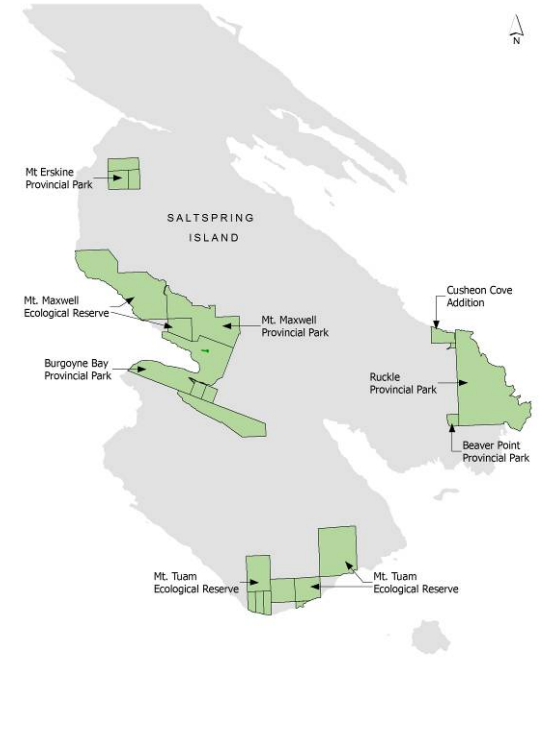
RW – Rural residential

This site type was mapped in Ruckle Provincial Park, the Cusheon Cove Addition and Burgoyne Bay Provincial Park where the homestead and barn sites exist. Although there are native trees, vegetation, and habitat at these sites, the character and ecological values have been modified to such an extent that they no longer support most of the integrated, long-term ecological roles of the native ecosystems occupying the site.

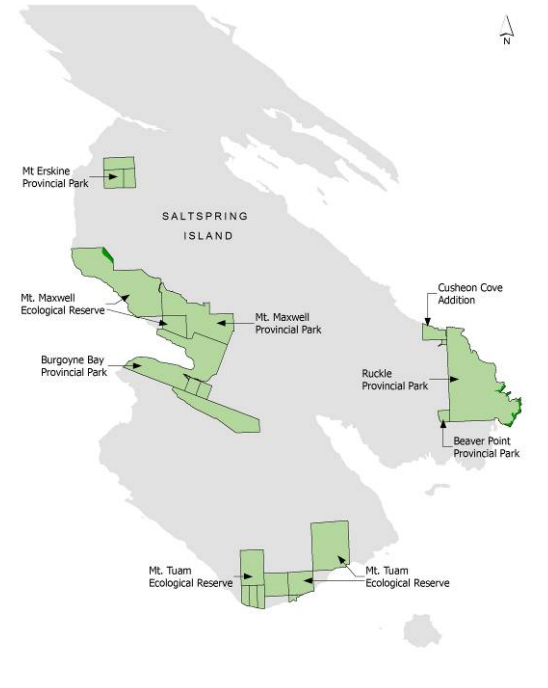
Ecosystem Polygons with ES Mapped within BC Parks (indicated in dark green)



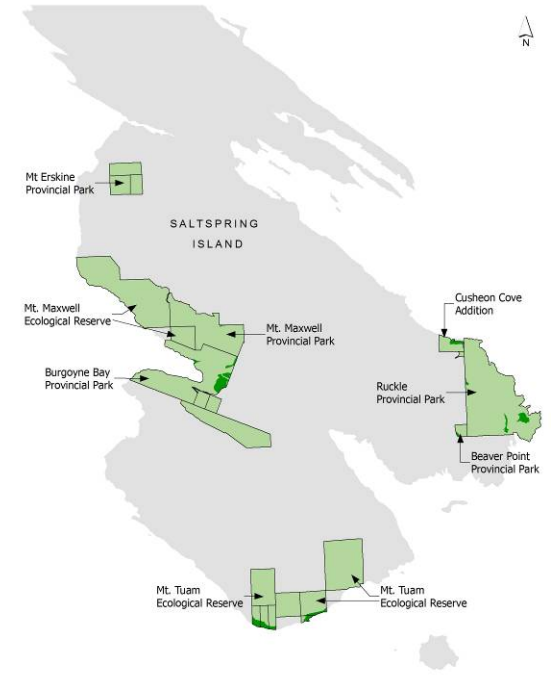
Ecosystem Polygons with GP Mapped within BC Parks (indicated in dark green)



Ecosystem Polygons with RO Mapped within BC Parks (indicated in dark green)



Ecosystem Polygons with RW Mapped within BC Parks (indicated in dark green)



3.3 Conservation Ranking

Every polygon was assigned a priority conservation ranking based on the final weighted value (see Step 5, Section 2.5 and Appendix XI); with results ranging from the lowest of 0.192 to the highest value of 0.966. The priority rankings were assigned to one of five categories for the following discussions: Very High (>0.932), High (0.830-0.932), Moderate (0.660-0.796), Low (0.592-0.626), and Very Low (0.192 to 0.388). There was a wide range of conservation rankings in each of the study areas, with overall moderate to high ranks.

The Mount Tuam Ecological Reserve and adjacent Crown Lands assessment areas had the narrowest range (0.626-0.966, mean 0.824; and 0.660-0.966, mean 0.860 respectively) reflecting good overall condition of the ecosystems (Figure 2). In contrast, Burgoyne Bay Provincial Park had the widest range of conservation ranking (0.192-0.966, mean 0.695), as well as the lowest mean value. This was not unexpected, given that some of the upland sites in Burgoyne Bay Provincial Park Addition have been logged recently, others within the past several decades, and much of the glaciofluvial valley is heavily modified agricultural fields, often containing high cover of invasive species. Overall, the areas assessed on Salt Spring Island were of moderate to high conservation value, providing further support of the importance of protection for these areas from development and disturbance. Figure 2 depicts the minimum, maximum, and average values of the conservation rankings within each of the areas.

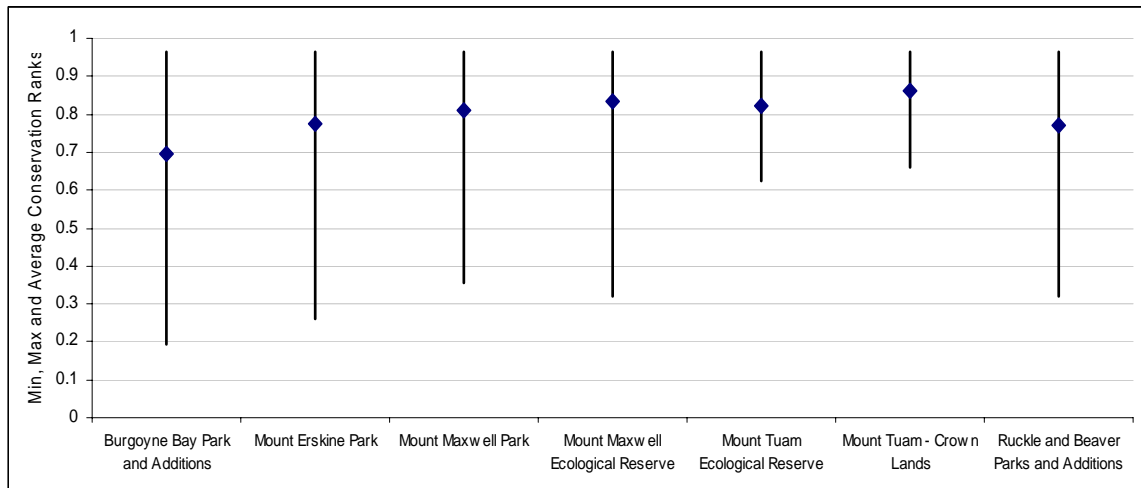


Figure 2. Conservation rankings for Parks, Ecological Reserves and Crown Lands assessment areas on Salt Spring Island: minimum, maximum and mean values.

4.0 STUDY AREA SUMMARIES

The following section describes the unique ecological characteristics of each of the study areas. A brief background of the area in relation to Park or Ecological Reserve designations and historical landuse is provided, followed by a summary of the ecological communities in each area, rare species and plant communities, disturbance, invasive species, conservation assessment rankings (including an interpretive map for each area), and wildlife observations.

4.1 Burgoyne Bay Provincial Park and Additions

4.1.1 Background

This park, ranging from the ocean to the rich valley, to the forested slopes above and contiguous with Mount Maxwell Provincial Park and Ecological Reserve to the north, was acquired in 2003 in conjunction with a group of local, provincial, and national partners. Its historic status and use as an agricultural homestead dominates the present condition of the lowland polygons and features in the evaluation of management options for this park. Recently, adjacent upland sites along the slopes of Mt. Sullivan have been added, increasing not only the area, but the diversity of habitats and ecosystems within the park, and the overall contiguous protected area in this portion of Salt Spring Island. Ecologically it shares polygons and ecosystem attributes and values with the southernmost part of Mount Maxwell. Many of these newly-acquired forested sites have been logged within the past few years to decades ago, and several paved and unpaved roads lie within the park.

4.1.2 Mapped Ecosystems

The upland areas of this park are within the CWHxm1, and the lowland sites are in the CDFmm. Of the indigenous ecological communities within the CDFmm part of the park, most are young seral to early mature forests (structural stages 4 and 5). Glaciomarine deposits and toe slopes support more productive forested communities. Some of these sites also contain mature forests (structural stage 6). Although they may have been harvested or disturbed concurrently with polygons in earlier structural stages, the higher inherent site productivity can support accelerated stand development such that stands would develop the structural characteristics of mature stands earlier.

Rare Plant Communities

Stands mapped as CDFmm/03 (TEM code DO (Douglas-fir – Oniongrass)) with a significant broadleaf (oak) component (>25% of the canopy) are likely to contain rare species. This ecosystem was mapped in Burgoyne Bay Provincial Park along the

south facing slopes adjacent to Mt. Maxwell Provincial Park and the western point of Burgoyne Bay (polygon #: 493, 524, and 527).

Polygons containing the ecosystem complex Garry oak - Brome/mixed grasses community (TEM map code QB), which also grew in a mosaic with the Fescue - Camas community, are also highly likely to contain rare plants and wildlife (especially rare butterflies) (one polygon mapped in the park at the northwestern point, polygon # 556). Other polygons likely to contain rare species are those shoreline areas with little to no disturbance.

Almost all mature (structural stages 5 and 6) forested ecosystems mapped within this park have the potential to support blue and red-listed plant communities. For example: polygon #499 contains 80% DS structural stage 6, polygon #1377 contains 100% DF structural stage 6, polygon #1566 contains 80% DG stage 6 and 20% DS stage 6, polygon #435 contains 100% RK stage 6, polygon # 1367 contains 100% RS stage 6, polygon # 469 contains 70% RK stage 6 and 30% DS stage 6, and polygon # 544 contains 20% DS stage 6. All of these polygons are ranked as having high to very high conservation values (Figure 3). Refer to individual ecosystem descriptions in Section 3.2 for more details. Also, a list of plant communities at risk in the CDFmm and CWHxm1 is included as Appendix III.

Rare Species

Appendix II provides a list of red and blue-listed species potentially occurring in CDFmm and CWHxm1, as well as information on known element occurrence (EOs) records for Parks, Ecological Reserves and surrounding areas on Salt Spring Island (BC Conservation Data Centre 2007). Each study area has a different character and location and contains a different suite of ecosystems, therefore each must be evaluated separately to determine which species it is likely to support.

Rare plant surveys were conducted by Dr. Adolf Ceska and Oluna Ceska at Burgoyne Bay in June of 2007. The main areas surveyed included ecosystems along the inner bay, cultivated fields, and the western point of the park. Only one rare plant species was encountered during the survey, the blue-listed Woolly heads (*Psilocarphus tenellus*) (Figure 3, plant symbol). This plant was found on the main access road through the park, and is commonly found on disturbed soils, paths and dirt roads in the CDF (pers. comm. Dr. Adolf Ceska). Lack of access limited surveys along the Garry oak stands on the south-facing slopes of the northern section of the park. However, it was assessed as having a very high likelihood of association with rare plant species (as mentioned above).

Trees of significance noted during the survey included a series of large Pacific Yew trees (*Taxus brevifolia*) growing along the inner harbour, seen easily from the main trail. Other noteworthy trees within the park include Arbutus and Pacific dogwood ‘record tree’ locations tracked by the BC CDC.

Appendix IV provides a summary table of all significant observations during rare plant surveys, while Appendix VIII provides a list of plant species observed (listed alphabetically by both common and latin names). The CDC does not have any other EO records entered in its database for rare species in this park or the associated recent additions. A historical record of a Bald Eagle nest was provided by the Salt Spring Island Conservancy (Figure 3, bird symbol).

4.1.3 Disturbance

Most of the polygons within the CDFmm portion of the park have been harvested, converted to agriculture, or otherwise modified by humans. Some of the shoreline sites and forests near the shoreline have been less impacted by disturbance. The parking area by the bay and an adjacent old quarry were mapped as anthropogenic sites. The cultivated fields by nature reflect frequent and ongoing disturbance. They provide a particular set of habitat attributes in their present state, particularly the seasonally flooded fields and ditches which support migratory birds, breeding birds and provide habitat connectivity for amphibians, respectively. However, BC Parks aims to weigh various management priorities and objectives with respect to maintaining the fields and buildings in their present state. Ecological and historical objectives will be weighed in light of long-term management objectives for this park to influence the extent and nature of ecological communities in Burgoyne Bay Provincial Park.

4.1.4 Invasive species

The cultivated fields typically are dominated by agronomic grasses and invasive species, including plantain, herb-robert, and knapweed. Many of the more recently harvested upland forests contain moderately high (25-50%) cover of invasive species, such as Scotch broom and grasses, hairy cat’s ear, foxglove, and others. The undisturbed (or not reflecting recent disturbance and fragmentation) polygons contain varying but typically small (5-25% cover) amounts of invasive species, particularly broom and grasses, with herbaceous exotics presently accounting for relatively low cover (<5%). As forested sites are allowed to recover from disturbance, the proportion of invasive species will decrease with increasing canopy closure and ingress of native species from adjacent areas. Sites near ditches and in fallow fields often contained Himalayan blackberry.

The sensitive meadow and shoreline ecosystems will not likely experience this same decrease in invasive species cover without proactive intervention (e.g., broom pulling). One caveat to note is that the soil disturbance created by removing some invasive species may outweigh the detrimental effects of leaving them and monitoring their abundance. The most common soil impacts are exposed mineral soils becoming ideal seedbeds for even more invasive species, and compaction of friable and thin soils on meadows and rocky substrates. Restoration of these sites requires a long-term commitment for annual removal of invasives.

4.1.5 Conservation Assessment and Ranking

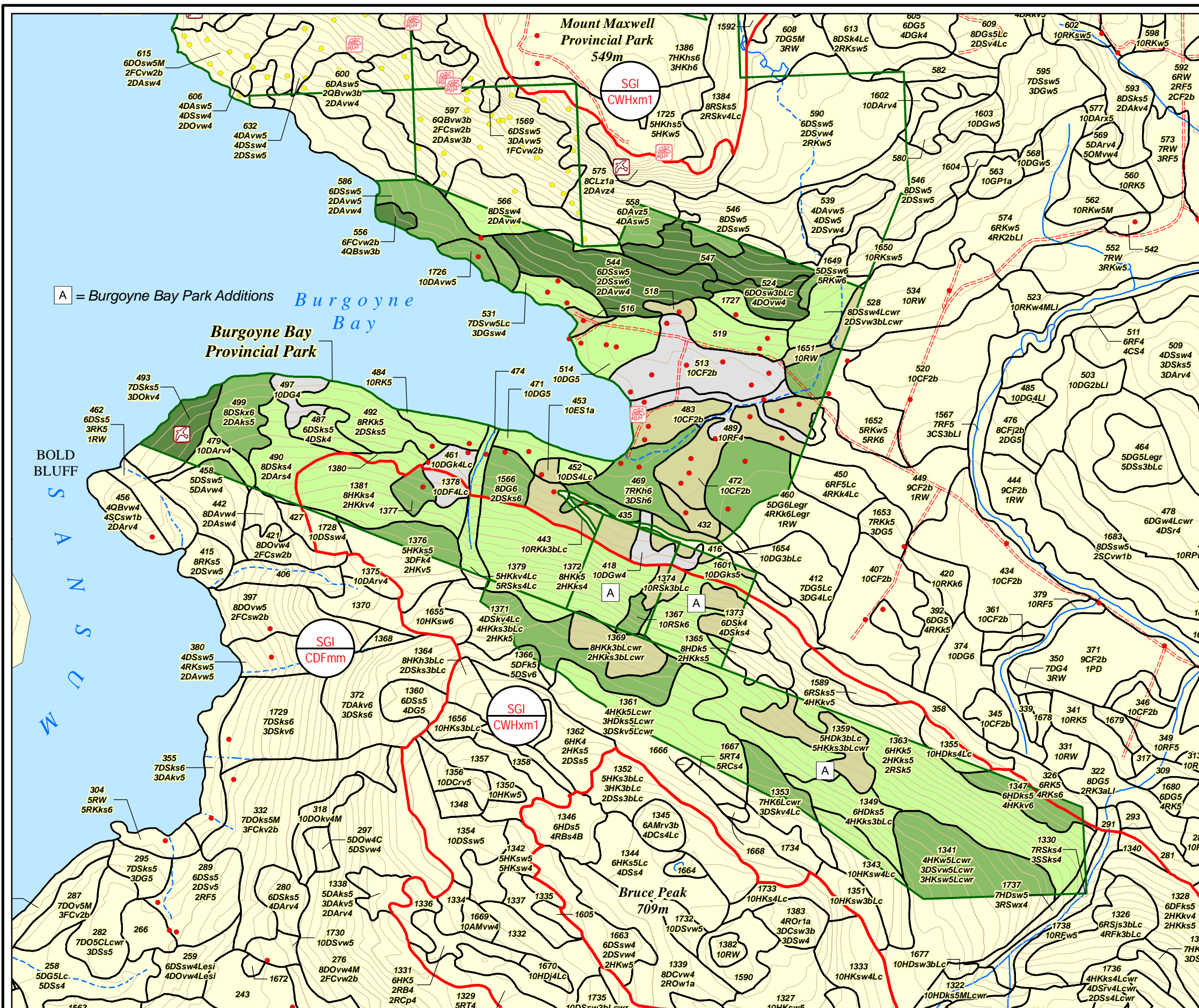
The conservation ranking was strongly influenced by the historic land use of the farmstead. This ranking system was designed to reflect solely the ecological value and sensitivity of a site, and not any historic or cultural values. The high cover of invasive species, land conversion to agriculture, and recent logging along the newly acquired hillslope Park Addition all yielded lower polygon rankings for those sites due to fragmentation and lower inherent biodiversity carrying capacity. Conservation rankings were highest in those polygons where oak meadows, herbaceous meadows, and mature forests were intact (Figure 3 and Appendix XI). This ranking reflects only the current status of these polygons: over time, left undisturbed, or with particular management regimes, the rankings of polygons would change, likely increasing as native vegetation recolonizes these sites.

4.1.6 Wildlife Observations

A rich variety of bird life inhabits Burgoyne Bay Provincial Park. The sheltered bay provides shorebird habitat, feeding grounds and resting stops for coastal migrants, and some suitable habitat for marine species that use the intertidal area. Eelgrass beds in Burgoyne Bay provide an important source of forage and habitat for diverse marine life. Great Blue Herons (blue-listed) have also been observed using the area. The forested areas contain typical bird species found throughout the CDFmm, including raptors, woodpeckers, passerines, corvids, and a range of transient species (Appendix X is a list of birds observed in the park by local naturalist Karen Ferguson). Snags and cavities were present in some of the older forests, providing potential habitat for primary and secondary cavity nesters, both birds and bats. The margins of the forest, where they abut onto the agricultural fields, also provide edge habitat and transitional edge-interior habitat for generalist species that may nest in the forest and forage on small mammals in the pasture. The anthropogenic features of this park also provide habitat: the barns are potential Barn Owl nest sites, as well as for bat species. The shrubbery along the ditches throughout the property also

provide habitat for common passerine species such as Song Sparrows. There is also a record of a Bald Eagle nest at the western point of the park (see Figure 3).

Burrows, tunnels, and other sign of small mammal presence were abundant in the lowland farmstead. These fields provide excellent hunting grounds for numerous raptors including the blue-listed Barn Owl, blue-listed Western Screech-owl, blue-listed Northern Pygmy-owl, red-listed Peregrine Falcon. Suitable habitat for shrews exists in the ditches and seasonally flooded sites, as well as freshwater riparian habitats at Burgoyne Bay Provincial Park. In the upland forests native red squirrels were present. Black-tailed deer sign and evidence of browse was found throughout the park in disturbed and undisturbed areas.



ECOSECTION & BIOGEOCLIMATIC UNITS		ECOSYSTEM UNIT LABEL	
SGI	← Ecosession	Polygon ID	← Site Modifier
CDFmm	← Biogeoclimatic Unit	Percentile	← Disturbance Code
		← Ecosystem Unit	← Stand Composition
			← Structural Stage

MAP SYMBOLS		
--- Road	● Plot Location - Maxwell TEM (2003)	Conservation Rank
--- Rivers & Creeks - Definite	● Plot Location - CDF TEM (2007)	Very High
--- Rivers & Creeks - Indefinite	☒ Rare Bird	High
--- Biogeoclimatic Unit	☒ Rare Plant	Moderate
□ Ecosystem Unit	☒ Rare Plant Community (Forest)	Low
□ Parks & Ecological Reserves	☒ Rare Plant Community (Oak)	Very Low

ECOSECTION & BIOGEOCLIMATIC UNITS	
Eosessions	Biogeoclimatic Units
SGI: Southern Gulf Islands	CDFmm: Coastal Douglas-Fir zone, moist maritime subzone
	CWHxm1: Coastal Western Hemlock zone, very dry maritime subzone, eastern variant

ECOSYSTEM UNITS MAPPED IN THE CDFmm				
Site Code	Description	Site Series	Assumed Modifiers	Soil Moisture Regime
CS	Western redcedar - Slough sedge	14	d, j, m	subhydic
DA	Douglas-fir - Shore pine - Arbutus	02	d, j, m, r	xeric
DG	Douglas-fir - Grand fir - Oregon grape	04	d, j, m	subxeric - mesic
DO	Douglas-fir - Oniongrass	03	d, m, r	xeric
DS	Douglas-fir - Salal	01	d, j, m	subxeric - mesic
FC	Fescue - Camas	00	j, m, s	subxeric
GO	Garry oak - Oceanspray	00	j, m, r	xeric - subxeric
HL	Hardhack - Labrador tea	00	d, j, p	subhydic
QB	Garry oak-Brome/mixed grasses	00	j, m, r	xeric - subxeric
RF	Western redcedar - Grand fir - Foamflower	06	d, j, m	subhydic - hygric
RK	Western redcedar - Douglas-fir - Oregon beaked moss	05	d, j, m	subhydic - hygric
RP	Western redcedar - Indian-plum	13	d, j, m	hygric
RS	Western redcedar - Snowberry	07	a, d, j, m	subhydic - hygric
RV	Western redcedar - Vanilla-leaf	12	d, j, m	subhydic
SC	Cladina - Wallace's selaginella	00	j, m, r, v	subxeric

ECOSYSTEM UNITS MAPPED IN THE CWHxm1				
Site Code	Description	Site Series	Assumed Modifiers	Soil Moisture Regime
AM	Arbutus - Hairy manzanita	00	j, r, s	xeric
DC	Douglas-fir - Shore pine-Cladina	02	d, j, m	very xeric
DF	Douglas-fir - Sword fern	04	d, j, m	xeric - subxeric
DS	Douglas-fir - Western hemlock - Salal	03	d, j, m	xeric - subxeric
HD	Western hemlock - Western redcedar - Deer fern	06	d, j, m	subhydic - hygric
HK	Douglas-fir - Western hemlock - Oregon beaked moss	01	d, j, m	submesic - mesic
HL	Hardhack - Labrador tea	00	d, j, p	subhydic
RF	Western redcedar - Grand fir - Foamflower	07	d, j, m	subhydic - hygric
RS	Western redcedar - Swordfern	05	d, j, m	submesic - mesic
SC	Cladina - Wallace's selaginella	00	j, m, r, v	very xeric

ANTHROPOGENIC AND SPARSELY VEGETATED UNITS			
Site Code	Description	Site Code	Description
BE	beach	ES	exposed soil
CF	cultivated field	GP	gravel pit
CL	cliff	RO	rock outcrop
CO	cultivated orchard	RW	rural developed

SITE MODIFIERS (Atypical Conditions)	
Code	Topography
g	gully: occurs within a gully, or with gully throughout the delineated area
h	hummocky terrain: indicated by the terrain surface expression
j	gentle slope: < 35% in the CWH and CDF zones
k	cool aspect: occurs on aspects 285-335, on moderately steep slopes (35%-100% in the CWH and CDF)
q	very steep cool aspect-very steep slopes (< 100%) with aspects 285-335
r	ridge: occurs throughout an area of ridged terrain, or on a ridge crest
w	warm aspect: 135-285, on moderately steep slopes (35%-100% slope in the CWH and CDF zones)
z	very steep warm aspect-slopes > 100% on aspects 135-285
Moisture	
x	drier than typical
y	moister than typical
Soil	
v	very shallow soils: < 20 cm to bedrock

STRUCTURAL STAGE & STRUCTURAL STAGE MODIFIERS	
Code	Structural Stage
1	Sparse/bryoid bryophytes and lichens dominant, may reflect recent disturbance; Sparse (1a) bare rock or ground (< 10% vegetation cover) / Bryoid (1b) bryophytes and lichens dominant
2	Herb some invading or residual shrubs and trees may be present, may reflect recent disturbance; Forb-dominated (2a) includes non-graminoid herbs and ferns; Graminoid-dominated (2b) grasses, sedges, rushes, reeds; Aquatic herbs (2c) dominate the site with standing water or submerged
3	Shrub Early successional stage or maintained by environmental conditions or disturbance
4	Low shrub (3a) < 2 m tall / Tall shrub (3b) 2-4 m tall
5	Pole/Sapling Trees > 10 m tall, often densely stocked, no vertical canopy structure, typically < 40 years since disturbance
6	Young Forest Self-thinning and canopy differentiation initiated, typically 40-80 years since disturbance
7	Mature Forest Mature tree canopy, typically 80-250 years since disturbance
	Old Forest Structurally complex stands comprised of shade-tolerant and regenerating tree species; snags and coarse woody debris and patchy understories, typically > 250 years since disturbance.
Stand Composition Modifiers	
B	broadleaf (> 75% of stand)
C	conifer (> 75% of stand)
M	mixed (neither comprises > 75% of stand)

DISTURBANCE CLASSES AND MODIFIERS			
B	Biotic Disturbances		
d	Domestic grazing/browsing		
L	Forest Harvesting		
c	clearcut system	e	selection system
wr	with reserves (patch retention)	gr	group selection
d	seed tree system	si	single tree
gr	grouped	l	land clearing

ADDITIONAL ECOSYSTEM LABELS			
416	10DG3bLc	519	6DSw5 2DGw5 2DSw5
432	10RK3bLl	547	6DOw5B 2DOw4M 2FCw2b
435	10RK6	1377	10DF6
516	5RW 5DG3bLl	1380	10DSk5
518	10GP21a	1727	10DSw5

Figure 3: Terrestrial Ecosystem Conservation Rankings: Burgoyne Bay Provincial Park

Map Revision Date: October 26, 2007
 Project ID: 07.0077
 Map Scale: 1:20,000



4.2 Mt. Maxwell Provincial Park

4.2.1 Background

Mount Maxwell Provincial Park was established as a Class “C” park on October 21, 1938 in recognition of its prominent landscape position and spectacular views from the top of Baynes Peak. It was then upgraded to a Class “A” provincial park on May 5, 1970. In 2004, 32 hectares of land was added to the northern part of the park, increasing its size to 231 ha. The park is designated as a provincial park under the *Park Act* and its boundaries are included in Schedule C of the *Protected Areas Act of British Columbia* (MoE Terms of Reference for Planning Process, March 2007).

Mount Maxwell Provincial Park now abuts the protected areas of Burgoyne Bay Provincial Park, which consists of the valley as well as the hillslopes of Mount Bruce. Together with Mount Maxwell Ecological Reserve and Burgoyne Bay Provincial Park and Additions, Mount Maxwell Provincial Park comprises the largest contiguous protected area in the Gulf Islands.

Field plot data from this study, as well as from prior studies of the adjacent Ecological Reserve (Madrone 2003), warranted increasing the elevation boundary of the upper limit for the CDFmm to approximately 550 m along the steep, well-drained, warm aspect slope of Baynes Peak. Approval for this shift was obtained from the Regional Ecologist. This encompassed the cliff and the forests along the steep slopes. Site topography, aspect, soil characteristics, and prevailing climate were all taken into consideration. Their cumulative influences resulted in ecosystems characteristic of the CDFmm throughout this area. On the top of Mt. Maxwell, on cool aspects, and the forested slopes along the roadway, the climate reflects the prevailing influence of slightly wetter, cooler maximum and mean temperatures and results in ecosystems characteristic of the CWHxm1, albeit showing influences of historic disturbance, particularly repeated selective logging and spacing.

4.2.2 Mapped Ecosystems

The mature Douglas-fir forest (structural stage 6) found in Mount Maxwell Provincial Park is of high ecological value. These mature forests are under-represented in the provincial protected areas and are cited in the Management Plan as meriting inclusion in the park for this reason (Anonymous 2003a). Also of significant ecological value, the steep cliff Mount Maxwell’s Baynes Peak is identified as a sensitive habitat, supporting potential and active habitat for cliff-nesting species including raptors and bats.

The remainder of the area is comprised largely of younger second-growth forests (structural stages 4 and 5), dominated by Douglas-fir with varying amounts of western hemlock and western redcedar towards the top of Baynes Peak, and scattered Pacific yew, with an understorey of salal, red huckleberry, oval-leaved blueberry, swordfern, and other species listed in the ecosystem descriptions (Section 3.2). There is a very gradual transition from the CWHxm1 to the CDFmm along the roadway.

On cool aspects at lower elevations, western hemlock and Pacific yew are absent, replaced by red alder, bigleaf maple, and grand fir. On dry sites, particularly on the side slopes, arbutus is moderately frequent. On lower warm-aspect slopes and polygons with shallow soils, arbutus increases in abundance, but typically forms open-canopied stands, with understories that include Oregon beaked moss, dicranum moss, common and trailing snowberry, ocean spray, Nootka rose, and hairy and orange honeysuckle. Some polygons with shallow soils, lithic contact, and hummocky to flat terrain supported forested ecosystems with fluctuating water tables, but these typically were restricted in area.

Rare Plant Communities

The majority of stands associated with Garry oak are located within the Mount Maxwell Ecological Reserves. Small sections of two of these polygons that overlap the Park and Ecological Reserve (#597 and #646) contain the the ecosystem complex Garry oak - Brome/mixed grasses community (TEM map code QB). This ecosystem type grows in a mosaic with the Fescue - Camas community (TEM code FC), and the sites are highly likely to contain rare plants and wildlife (especially rare butterflies).

Almost all mature (structural stages 5 and 6) forested ecosystems mapped within this park have the potential to support blue and red-listed plant communities. For example: the very large polygon #1386 located at the top of Mt. Maxwell, which contains 100% HK (site series 01 in the CWHxm1) stage 6 forest. Polygon # 1392 contains 70% HK stage 5 and 30% DS stage 6; polygon #1593 contains 40% RF stages 6 and 30% HD stage 6. These polygons are ranked as having high to very high conservation values (Figure 4). Refer to individual ecosystem descriptions in Section 3.2 for more details. Also, a complete list of plant communities at risk in the CDFmm and CWHxm1 is included as Appendix III.

Rare Species

Appendix II provides a list of red and blue-listed species potentially occurring in CDFmm and CWHxm1, as well as information on known element occurrence (EOs) records for Parks, Ecological Reserves and surrounding areas on Salt Spring Island (BC Conservation Data Centre 2007). Each study area has a different character and

location and contains a different suite of ecosystems, therefore each must be evaluated separately to determine which species it is likely to support.

To our knowledge, no detailed rare plant surveys have occurred within the Park portion of this area, however, rare plant surveys were conducted in previous years within Mt. Maxwell Ecological Reserve by Dr. Adolf Ceska and Oluna Ceska (2003) and Dr. Hans Roemer (1999) (Appendices IV, V and VI). It is likely that there is significant overlap in plant species found in both areas within the same habitat types. Records that exist for rare plants species in the park include: Slimleaf Onion (*Allium amplexans*) (blue-listed) found on south-facing bluffs and ledges (associated with rock outcrops); Scalepod (*Idahoia scapigera*) (red-listed) found on southwest facing mossy and wet outcrops (also associated with rock outcrops); Gray's Desert-parsley or Lomatium (*Lomatium grayi*) (blue-listed); and California hedge-parsley (*Yabea microcarpa*) (red-listed). Refer to Appendix II for further details on these element occurrence records (BC CDC 2007). In addition, there are two records of the blue-listed Farewell-to-spring (*Clarkia amoena*) by Dr. Adolf Ceska in 2003 observed in polygon #597, located on the southwestern boundary of the Park and Ecological Reserve.

Rare butterflies recorded for the area include: Propertius Duskywing (*Erynnis propertius*) (blue-listed) and Moss' Elfin (*Callophrys mossii mossii*) (blue-listed). Red-listed Peregrine Falcons (*Falco peregrinus anatum*) have been successfully nesting near Baynes Peak since 2000, and are monitored annually by the Ministry of Environment.

4.2.3 Disturbance

In Douglas-fir-dominated sites, influences of past harvesting remain in the form of stumps, woody debris, and modified tree species representation, stocking, and understories that may be atypical relative to other site characteristics, reflecting past disturbance to the soil and/or seedbed. Some sites showed evidence of past clearcutting, while others were selectively harvested and/or precommercially thinned. Such thinning was not visible on air photos. After precommercial thinning, canopy closure is rapid as primary productivity, limited by site characteristics, is reallocated to the remaining stems which preferentially redistribute photosynthate to increase foliar surface area. On air photos, therefore, these stands do not appear different than others in the same structural stage.

Historic homestead use of the area also included permitting livestock to forage freely in the area, resulting in dispersal of agronomic invasive herbaceous species, such as

orchardgrass, foxtail barley, bluegrass species, timothy, plantain, alfalfa, and many others. These were most common along the roadside in open canopy areas, and in relatively accessible meadow sites. During both this and previous surveys (Madrone 2003), evidence of use by feral sheep was noted.

Currently, the primary disturbance factor influencing the ecological condition of polygons in Mount Maxwell Provincial Park is the access road. Although too small to be a discrete polygon, it may act as a barrier to some species, most likely invertebrates and reptiles that would be vulnerable to traffic-caused mortality. The trails throughout the park are too small and sporadic to cause substantial disturbance. Around the parking lot and viewpoint, however, trampling has impacted some plants and soils, and invasive species immediately around the parking lot are more frequent in that localized area.

4.2.4 *Invasive species*

While invasive species were not particularly prevalent in the forested ecosystems of Mount Maxwell Provincial Park, meadow sites often contained low to moderate cover of Scotch broom (1-25%), and similar proportions of invasive grass species. Other invasive species that frequently occur throughout Salt Spring Island, and are most likely dispersed in Mount Maxwell Provincial Park by seed detaching from mud or crevices on vehicles and visitors on foot include foxglove, orange hawkweed, hairy cat's ear, common dandelion, sweet vernalgrass, hedgehog dogtail, early hairgrass, lamb's quarters, and daphne-laurel.

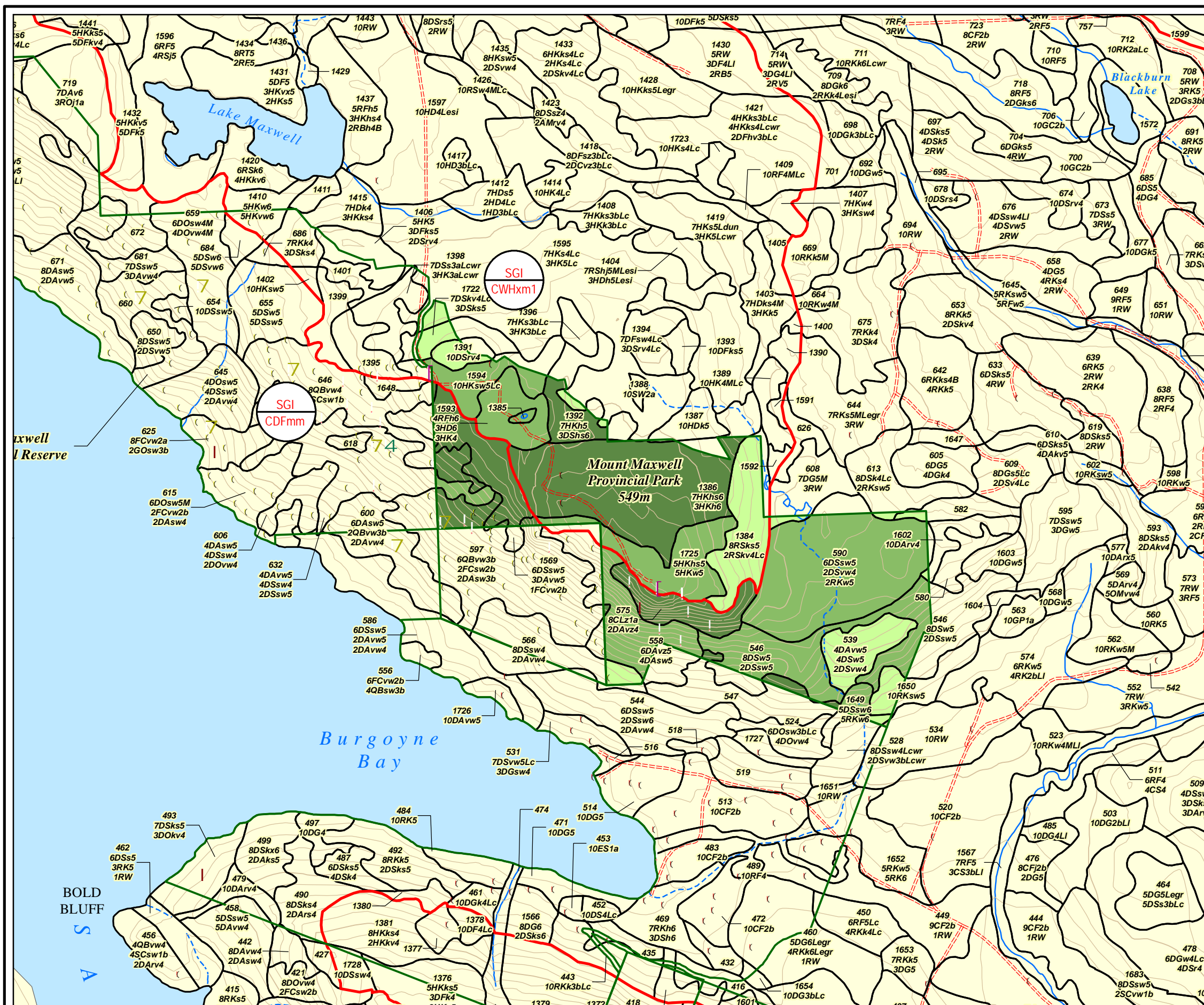
4.2.5 *Conservation Assessment and Ranking*

As shown in Figure 4, polygons within the Park ranged widely in their final conservation rankings, reflecting the diversity of habitats and conditions (Appendix XI). Overall, the majority of the Park ranked high to very high for conservation values due to association with rare species, presence of large patches of mature forest, and condition.

The sensitive, undisturbed, non-fragmented ecosystems that also are most likely to contain rare species were ranked the highest (e.g., the cliff, and mature forest), while forest polygons that were recently harvested (structural stages 3 and 4) were ranked lowest (unless rare species were known to occur there). As noted for Burgoyne Bay Provincial Park, however, the young forest represents only one temporal phase and over time, these ecosystems will recover to support higher values if left undisturbed.

4.2.6 Wildlife Observations

The cliffs along the scarp of Baynes Peak contain nesting sites birds of prey, Turkey Vultures, and bat species (Anonymous 2003a). Vultures were observed soaring, as were bald eagles, red-tailed hawks and corvids. Coastal black-tailed deer were observed throughout the area, with sign of browse on herbs and shrubs. The only native squirrel on the coast (the red squirrel – *Tamiasciurus hudsonicus*) was also seen in the mature forest stands.



ECOSECTION & BIOGEOCLIMATIC UNITS		ECOSYSTEM UNIT LABEL		
	← Ecosession		← Site Modifier	
	← Biogeoclimatic Unit		← Disturbance Code	
			← Ecosystem Unit	
			← Stand Composition	
			← Structural Stage	
MAP SYMBOLS				
	Road		Plot Location - Maxwell TEM (2003)	
	Rivers & Creeks - Definite		Plot Location - CDF TEM (2007)	
	Rivers & Creeks - Indefinite		Rare Bird	
	Biogeoclimatic Unit		Rare Plant	
	Ecosystem Unit		Rare Plant Community (Forest)	
	Parks & Ecological Reserves		Rare Plant Community (Oak)	
			Rare Butterfly	
			Very High	
			High	
			Moderate	
			Low	
			Very Low	
ECOSECTION & BIOGEOCLIMATIC UNITS				
Ecosessions		Biogeoclimatic Units		
SGI: Southern Gull Islands		CDFmm: Coastal Douglas-Fir zone, moist maritime subzone		
		CWHxm1: Coastal Western Hemlock zone, very dry maritime subzone, eastern variant		
ECOSYSTEM UNITS MAPPED IN THE CDFmm				
Site Code	Description	Site Series	Assumed Modifiers	Soil Moisture Regime
CS	Western redcedar - Slough sedge	14	d, j, m	subhydic
DA	Douglasfir - Shore pine - Arbutus	02	d, j, m, r	xeric
DG	Douglasfir - Grand fir - Oregon grape	04	d, j, m	subxeric - mesic
DO	Douglasfir - Oniongrass	03	d, m, r	xeric
DS	Douglasfir - Salal	01	d, j, m	subxeric - mesic
FC	Fescue - Camas	00	j, m, s	subxeric
GO	Garry oak - Oceanspray	00	j, m, r	xeric - subxeric
HL	Hardhack - Labrador tea	00	d, j, p	subhydic
QB	Garry oak-Brome/mixed grasses	00	j, m, r	xeric - subxeric
RF	Western redcedar - Grand fir - Foamflower	06	d, j, m	subhydic - hygric
RK	Western redcedar - Douglasfir - Oregon beaked moss	05	d, j, m	subhydic - hygric
RP	Western redcedar - Indian-plum	13	d, j, m	hygric
RS	Western redcedar - Snowberry	07	a, d, j, m	subhydic - hygric
RV	Western redcedar - Vanilla-leaf	12	d, j, m	subhydic
SC	Cladina - Wallace's selaginella	00	j, m, r, v	subxeric
ECOSYSTEM UNITS MAPPED IN THE CWHxm1				
Site Code	Description	Site Series	Assumed Modifiers	Soil Moisture Regime
AM	Arbutus - Hairy manzanita	00	j, r, s	xeric
DC	Douglasfir - Shore pine-Cladina	02	d, j, m	very xeric
DF	Douglasfir - Sword fern	04	d, j, m	xeric - subxeric
DS	Douglasfir - Western hemlock - Salal	03	d, j, m	xeric - subxeric
HD	Western hemlock - Western redcedar - Deer fern	06	d, j, m	subhydic - hygric
HL	Douglasfir - Western hemlock - Oregon beaked moss	01	d, j, m	submesic - mesic
HL	Hardhack - Labrador tea	00	d, j, p	subhydic
RS	Western redcedar - Grand fir - Foamflower	07	d, j, m	subhydic - hygric
RF	Western redcedar - Swordfern	05	d, j, m	subxeric - mesic
SC	Cladina - Wallace's selaginella	00	j, m, r, v	very xeric
ANTHROPOGENIC AND SPARSELY VEGETATED UNITS				
Site Code	Description	Site Code	Description	
BE	beach	ES	exposed soil	
CF	cultivated field	GP	gravel pit	
CL	cliff	RO	rock outcrop	
CO	cultivated orchard	RW	rural developed	
SITE MODIFIERS (Atypical Conditions)				
Code	Description	Code	Description	
g	Topography			
g	gully: occurs within a gully, or with gully throughout the delineated area			
h	hummocky terrain: indicated by the terrain surface expression			
j	gentle slope: < 35% in the CWH and CDF zones			
k	cool aspect: occurs on aspects 285-135, on moderately steep slopes (35%-100% in the CWH and CDF)			
q	very steep cool aspect-very steep slopes (< 100%) with aspects 285-135			
r	ridge: occurs throughout an area of ridged terrain, or on a ridge crest			
w	warm aspect: 135-285, on moderately steep slopes (35%-100% slope in the CWH and CDF zones)			
z	very steep warm aspect -slopes > 100% on aspects 135-285			
Code	Moisture			
x	drier than typical			
y	moister than typical			
Code	Soil			
v	very shallow soils: < 20 cm to bedrock			
STRUCTURAL STAGE & STRUCTURAL STAGE MODIFIERS				
Code	Structural Stage			
1	Sparse/bryoid bryophytes and lichens dominant, may reflect recent disturbance; Sparse (1a) bare rock or ground (< 10% vegetation cover) / Bryoid (1b) bryophytes and lichens dominant			
2	Herb some invading or residual shrubs and trees may be present, may reflect recent disturbance; Forb-dominated (2a) includes non-graminoid herbs and ferns; Graminoid-dominated (2b) grasses, sedges, rushes, reeds; Aquatic herbs (2c) dominate the site with standing water or submerged			
3	Shrub Early successional stage or maintained by environmental conditions or disturbance			
	Low shrub (3a) < 2 m tall / Tall shrub (3b) 2-4 m tall			
4	Pole/Sapling Trees > 10 m tall, often densely stocked, no vertical canopy structure, typically < 40 years since disturbance			
5	Young Forest Self-thinning and canopy differentiation initiated, typically 40-80 years since disturbance			
6	Mature Forest Mature tree canopy, typically 80-250 years since disturbance			
7	Old Forest Structurally complex stands comprised mainly of shade-tolerant and regenerating tree species; snags and coarse woody debris and patchy understories, typically > 250 years since disturbance.			
Code	Stand Composition Modifiers			
B	broadleaf (> 75% of stand)			
C	conifer (> 75% of stand)			
M	mixed (neither comprises > 75% of stand)			
DISTURBANCE CLASSES AND MODIFIERS				
Code	Disturbance			
B	Biotic Disturbances			
d	§ Domestic grazing/browsing			
L	Forest Harvesting			
c	§ clearcut system	L	Forest Harvesting	
o	with reserves (patch retention)	e	selection system	
d	§ seed tree system	gr	group selection	
gr	§ grouped	si	single tree	
		l	land clearing	
ADDITIONAL ECOSYSTEM LABELS				
618	8DOvw5 2DOsw5	1399	7HK 4 3HKs 5	
660	6DOsw4 M 2QBvw4 2FCvw2a	1401	10HKw 3a Lc	
672	6DOsw4 M 3DAvw4 1FCvw2b	1637	10RKs 5 M	
1385	10HL 3a	1639	7DSw5 3DAvw5	
1395	6DSw6 2SCvw1b 2DCs4	1648	10DAvw4	

Figure 4: Terrestrial Ecosystem Conservation Rankings: Mt. Maxwell Provincial Park

Map Revision Date: October 26, 2007
 Project ID: 07.0077
 Map Scale: 1:20,000



4.3 Mt. Maxwell Ecological Reserve

4.3.1 Background

In 1972, the Mount Maxwell Ecological Reserve, comprising 65 hectares on the north side of Burgoyne Bay, on southwest Salt Spring Island, was established under the *Ecological Reserve Act*. Salt Spring Island is home to Canada's largest Garry oak woodland, one of the most threatened ecosystems in the country. In Canada, Garry oak woodlands are found only on southern Vancouver Island, the Gulf Islands, and in two isolated locations in the Fraser River Valley. Since its inception, the Mount Maxwell Ecological Reserve has conserved within its boundaries stands of Garry oak and associated vegetation that are representative of this ecosystem (MoE Draft Management Plan, 2002).

In 2001, several parcels of land adjacent to the ecological reserve were purchased by The Nature Trust of British Columbia to add further protection to the Garry oak meadows and associated vegetation. These lands, totalling 280 hectares, have subsequently been leased to the Provincial Government on a 99-year term during which time the Environmental Stewardship Division (formerly BC Parks) of the Ministry of Water, Land and Air Protection, will manage the land as an extension of the ecological reserve. The Nature Trust lands were acquired with funding assistance from the Private Forest Biodiversity Program, a provincial land acquisition fund that was established to conserve biodiversity by acquiring interests in private forest land. The Private Forest Biodiversity Program targets forest ecosystems on private lands that have not been adequately represented in private and public conservation initiatives. The acquisition was funded by Forest Renewal BC and The Nature Trust with the intent that this site be leased under a long-term agreement with the Province for inclusion and management as a single unit of land with the existing Mount Maxwell Ecological Reserve (MoE Draft Management Plan, 2002).

From this point forward, the original 65-hectare reserve and the adjoining 280 hectares owned by The Nature Trust and leased to the Province, will be referred to and managed as the **Mount Maxwell Ecological Reserve**.

Field plot data from this study, as well as from prior studies (Madrone 2003), warranted increasing the elevation boundary of the upper limit for the CDFmm from 150 m to approximately 550 m along the steep, well-drained, warm aspect slopes. Approval for this shift was obtained from the Regional Ecologist. This encompassed the oak meadows and the forests along the steep slopes. Site topography, aspect, soil characteristics, and prevailing climate were all taken into consideration. Their cumulative influences resulted in ecosystems characteristic of the CDFmm throughout this area.

4.3.2 Mapped Ecosystems

The most prominent ecological community on Mount Maxwell Ecological Reserve is the mosaic of polygons that comprises the Garry oak meadow complex. This contains Garry oak-brome/mixed grasses (Ecosystem TEM label QB), Garry-oak oceanspray (TEM label GO), and Garry oak-Douglas-fir communities (TEM label DO), as well as terrestrial herbaceous fescue-camas meadows and rock outcrops colonized by bryophytes and cryptogams. The oak communities are described in further detail in the ecosystem descriptions (Section 3.2). Red and blue-listed species are frequently found in these ecosystem types, by virtue of their ecologically restricted niches and the limited spatial extent of these ecosystems.

The remainder of the area is comprised largely of second-growth forests (structural stages 4 and 5), dominated by Douglas-fir with varying amounts of western hemlock, and scattered Pacific yew, with an understorey of salal, red huckleberry, oval-leaved blueberry, swordfern, and other species listed in the ecosystem descriptions (Section 3.2). On cool aspects at lower elevations, western hemlock and Pacific yew are absent, replaced by red alder, bigleaf maple, and grand fir. On dry sites, particularly on the side slopes, arbutus is moderately frequent. On lower warm-aspect slopes and polygons with shallow soils, arbutus increases in abundance, but typically forms open-canopied stands, with understories that include Oregon beaked moss, dicranum moss, common and trailing snowberry, ocean spray, Nootka rose, and hairy and orange honeysuckle.

Riparian areas were extremely localized and limited to the immediate creek channel – bench ecosystems were infrequent and occupied only the depression or gully containing the channel. Some polygons with shallow soils, lithic contact, and hummocky to flat terrain supported forested ecosystems with fluctuating water tables, but these typically were restricted in area.

Rare Plant Communities

Mount Maxwell Ecological Reserve contains significant stands of Garry oak. TEM map codes associated with Garry oak include the QB (Garry oak-brome/mixed grasses), GO (Garry-oak oceanspray) and DO (Douglas-fir – Oniongrass, site series 03). All three of these ecosystems should be considered to be red-listed plant communities. There are many polygons of significance in this area, all indicated by high and very high conservation value rankings (Figure 5). The red-listed Garry-oak – Oniongrass, and Garry oak – Brome plant communities have been confirmed in the Ecological Reserve (BC CDC 2007).

In addition to Garry oak stands, almost all mature (structural stages 5 and 6) coniferous and mixed forested ecosystems mapped within this Ecological Reserve have the potential to support blue and red-listed plant communities. These polygons are ranked as having high to very high conservation values (Figure 5). Refer to individual ecosystem descriptions in Section 3.2 for more details. The red-listed Douglas-fir – Arbutus plant community has been confirmed in the Ecological Reserve (BC CDC 2007). A complete list of plant communities at risk in the CDFmm and CWHxm1 is included as Appendix III.

Rare Species

Appendix II provides a list of red and blue-listed species potentially occurring in CDFmm and CWHxm1, as well as information on known element occurrence (EOs) records for Parks, Ecological Reserves and surrounding areas on Salt Spring Island (BC Conservation Data Centre 2007). Each study area has a different character and location and contains a different suite of ecosystems, therefore each must be evaluated separately to determine which species it is likely to support.

Rare plant surveys have occurred within the Mt. Maxwell Ecological Reserve by Dr. Adolf Ceska and Oluna Ceska (2003) and Dr. Hans Roemer (1999) (Appendices IV, V and VI). Records that exist for rare plants species in the Ecological Reserve include: California hedge-parsley (*Yabea microcarpa*) (red-listed) and Yellow Montane Violet (*Viola praemorsa*) (red-listed). Refer to Appendix II for further details on these element occurrence records (BC CDC 2007). In addition, there are two records of the blue-listed Farewell-to-spring (*Clarkia amoena*) by Dr. Adolf Ceska in 2003 observed in polygon #597, located on the southwestern boundary of the Park and Ecological Reserve.

The Propertius Duskywing (*Erynnis propertius*) (blue-listed) has been observed in the Ecological Reserve as well as the adjacent Park. There is one historical record of a possible Great Blue-heron (blue-listed) nesting area along the shoreline of the Ecological Reserve (see Figure 5, bird symbol in polygon #625).

4.3.3 Disturbance

Historic fire frequency may have been elevated by pre-contact First Nations in the oak meadows to encourage propagation of food plants. Fire suppression in oak meadows has led to increased frequency and size of oak and other trees, and a corresponding decrease in herbaceous species, particularly ephemeral species and species dependent on fire for regeneration. Oak meadows are effectively disclimax or occasionally edaphic climax ecosystems. These disturbance-maintained meadows

may be succeeding to oak forests, and eventually may become Douglas-fir—Garry oak forested ecosystems. The Garry Oak Ecosystem Recovery Team has mapped historic and contemporary distributions of oak ecosystems in the area, and suggested similar trends (Lea 2006). The major factor causing the decline of oak meadows and ecosystems is habitat alienation.

In Douglas-fir-dominated sites, influences of past harvesting remain in the form of stumps, woody debris, and modified tree species representation, stocking, and understories that may be atypical relative to other site characteristics, reflecting past disturbance to the soil and/or seedbed. Some sites showed evidence of past clearcutting, while others were selectively harvested and/or precommercially thinned. Such thinning was not visible on air photos. After precommercial thinning, canopy closure is rapid as primary productivity, limited by site characteristics, is reallocated to the remaining stems which preferentially redistribute photosynthate to increase foliar surface area. On air photos, therefore, these stands do not appear different than others in the same structural stage.

Historic homestead use of the area also included permitting livestock to forage freely in the area, resulting in dispersal of agronomic invasive herbaceous species, such as orchardgrass, foxtail barley, bluegrass species, timothy, plantain, alfalfa, and many others. These were most common along the roadside in open canopy areas, and in relatively accessible meadow sites. During both this and previous surveys (Madrone 2003), evidence of use by feral sheep was noted.

4.3.4 *Invasive species*

While invasive species were not particularly prevalent in the forested ecosystems of Mount Maxwell Ecological Reserve, meadow sites often contained low to moderate cover of Scotch broom (1-25%), and similar proportions of invasive grass species. Other invasive species that frequently occur throughout Salt Spring Island include foxglove, orange hawkweed, hairy cat's ear, common dandelion, sweet vernalgrass, hedgehog dogtail, early hairgrass, lamb's quarters, and daphne-laurel.

4.3.5 *Conservation Assessment and Ranking*

As shown in Figure 5, polygons within the Ecological Reserve ranged widely in their final conservation rankings, reflecting the diversity of habitats and conditions (Appendix XI). Within the area, only two polygons were ranked as having low conservation value in their present condition (polygons #1398 and 1401). This site was recently clearcut with reserve patches retained and is in the early structural stage 3a (<2 m tall regenerating shrubs and trees). The majority of the area, however,

ranked high to very high conservation value due to association with rare species, Garry oak ecosystems and condition.

The sensitive, undisturbed, non-fragmented ecosystems that also are most likely to contain rare species were ranked the highest (e.g., oak meadow polygons and herbaceous meadows), while forest polygons that were recently clearcut were ranked lowest. It is important to note that the young seral stage of recently cleared forest represents only one temporal phase. Over time, these ecosystems will recover to support higher values if left undisturbed.

4.3.6 *Wildlife Observations*

Rocky slopes containing colluvium and talus in the oak meadows provide potential habitat for Sharp-tailed Snake (red-listed), while the oak ecosystems support habitat for hundreds of red and blue-listed plant and wildlife species and subspecies (GOERT 2006), with a particular focus on invertebrates such as butterflies. Numerous songbirds are also associated with the oak meadows and forested ecosystems. Coastal black-tailed deer were observed throughout the area, with sign of browse on herbs and shrubs.

During a previous assessment in the fall and winter (Madrone 2003), tree frogs, alligator lizards, blue grouse, Hutton's and Cassin's Vireo, Band-tailed Pigeon (blue-listed), Turkey Vulture, Bald Eagle, and a mink were observed. A Satyr Angleming was also noted, but climatic conditions were not suitable for a detailed butterfly survey.



ECOSECTION & BIOGEOCLIMATIC UNITS		ECOSYSTEM UNIT LABEL		
	← Ecosession		← Site Modifier	
	← Biogeoclimatic Unit		← Disturbance Code	
			← Ecosystem Unit	
			← Stand Composition	
			← Structural Stage	
MAP SYMBOLS				
	Road		Plot Location - Maxwell TEM (2003)	
	Rivers & Creeks- Definite		Plot Location - CDF TEM (2007)	
	Rivers & Creeks - Indefinite		Rare Bird	
	Biogeoclimatic Unit		Rare Plant	
	Ecosystem Unit		Rare Plant Community (Forest)	
	Parks & Ecological Reserves		Rare Plant Community (Oak)	
			Rare Butterfly	
			Very High	
			High	
			Moderate	
			Low	
			Very Low	
ECOSECTION & BIOGEOCLIMATIC UNITS				
Ecosessions		Biogeoclimatic Units:		
SGI: Southern Gulf Islands		CDFmm: Coastal Douglas-Fir zone, moist maritime subzone		
		CWHxm1: Coastal Western Hemlock zone, very dry maritime subzone, eastern variant		
ECOSYSTEM UNITS MAPPED IN THE CDFmm				
Site Code	Description	Site Series	Assumed Modifiers	Soil Moisture Regime
CS	Western redcedar - Slough sedge	14	d, j, m	subhygic
DA	Douglas-fir - Shore pine - Arbutus	02	d, j, m, r	xeric
DG	Douglas-fir - Grand fir - Oregon grape	04	d, j, m	subxeric - mesic
DO	Douglas-fir - Oniongrass	03	d, m, r	xeric
DS	Douglas-fir - Salal	01	d, j, m	subxeric - mesic
FC	Fescue - Camas	00	j, m, s	subxeric
GO	Garry oak - Oceanspray	00	j, m, r	xeric - subxeric
HL	Hardhack - Labrador tea	00	d, j, p	subhygic
QB	Garry oak-Brome/mixed grasses	00	j, m, r	xeric - subxeric
RF	Western redcedar - Grand fir - Foamflower	06	d, j, m	subhygic - hygic
RK	Western redcedar - Douglas-fir - Oregon beaked moss	05	d, j, m	subhygic - hygic
RP	Western redcedar - Indian-plum	13	d, j, m	hygic
RS	Western redcedar - Snowberry	07	a, d, j, m	subhygic - hygic
RV	Western redcedar - Vanilla-leaf	12	d, j, m	subhygic
SC	Cladina - Wallace's selaginella	00	j, m, r, v	subxeric
ECOSYSTEM UNITS MAPPED IN THE CWHxm1				
Site Code	Description	Site Series	Assumed Modifiers	Soil Moisture Regime
AM	Arbutus - Hairy manzanita	00	j, r, s	xeric
DC	Douglas-fir - Shore pine-Cladina	02	d, j, m	very xeric
DF	Douglas-fir - Sword fern	04	d, j, m	xeric - subxeric
DS	Douglas-fir - Western hemlock - Salal	03	d, j, m	xeric - subxeric
HD	Western hemlock - Western redcedar - Deer fern	06	d, j, m	subhygic - hygic
HK	Douglas-fir - Western hemlock - Oregon beaked moss	01	d, j, m	submesic - mesic
HL	Hardhack - Labrador tea	00	d, j, p	subhygic
RF	Western redcedar - Grand fir - Foamflower	07	d, j, m	subhygic - hygic
RS	Western redcedar - Swortfern	05	d, j, m	submesic - mesic
SC	Cladina - Wallace's selaginella	00	j, m, r, v	very xeric
ANTHROPOGENIC AND SPARSELY VEGETATED UNITS				
Site Code	Description	Site Code	Description	
BE	beach	ES	exposed soil	
CF	cultivated field	GP	gravel pit	
CL	cliff	RO	rock outcrop	
CO	cultivated orchard	RW	rural developed	
SITE MODIFIERS (Atypical Conditions)				
Code	Topography			
g	gullying: occurs within a gully, or with gullying throughout the delineated area			
h	hummocky terrain: indicated by the terrain surface expression			
j	gentle slope: < 35% in the CWH and CDF zones			
k	cool aspect: occurs on aspects 285-135, on moderately steep slopes (35%-100% in the CWH and CDF)			
q	very steep cool aspect-very steep slopes (< 100%) with aspects 285-135			
r	ridge: occurs throughout an area of ridged terrain, or on a ridge crest			
w	warm aspect: 135-285, on moderately steep slopes (35%-100% slope in the CWH and CDF zones)			
z	very steep warm aspect -slopes > 100% on aspects 135-285			
Code	Moisture			
x	drier than typical			
y	moister than typical			
Code	Soil			
v	very shallow soils: < 20 cm to bedrock			
STRUCTURAL STAGE & STRUCTURAL STAGE MODIFIERS				
Code	Structural Stage			
1	Sparse/bryoid bryophytes and lichens dominant, may reflect recent disturbance; Sparse (1a) bare rock or ground (< 10% vegetation cover) / Bryoid (1b) bryophytes and lichens dominant			
2	Herb some invading or residual shrubs and trees may be present, may reflect recent disturbance; Forb-dominated (2a) includes non-graminoid herbs and ferns; Graminoid-dominated (2b) grasses, sedges, rushes, reeds; Aquatic herbs (2c) dominate the site with standing water or submerged			
3	Shrub Early successional stage or maintained by environmental conditions or disturbance Low shrub (3a) < 2 m tall / Tall shrub (3b) 2-4 m tall			
4	Pole/Sapling Trees > 10 m tall, often densely stocked, no vertical canopy structure, typically < 40 years since disturbance			
5	Young Forest Self-thinning and canopy differentiation initiated, typically 40-80 years since disturbance			
6	Mature Forest Mature tree canopy, typically 80-250 years since disturbance			
7	Old Forest Structurally complex stands comprised mainly of shade-tolerant and regenerating tree species; snags and coarse woody debris and patchy understories, typically > 250 years since disturbance.			
Code	Sand Composition Modifiers			
B	broadleaf (> 75% of stand)			
C	conifer (> 75% of stand)			
M	mixed (neither comprises > 75% of stand)			
DISTURBANCE CLASSES AND MODIFIERS				
B	Biotic Disturbances			
d	§ Domestic grazing/browsing			
L	Forest Harvesting			
c	§ clearcut system	L	Forest Harvesting	
wr	○ with reserves (patch retention)	e	§ selection system	
d	§ seed tree system	gr	○ group selection	
gr	○ grouped	si	○ single tree	
		l	§ land clearing	
ADDITIONAL ECOSYSTEM LABELS				
618	8DOvw5 2DOsw5	1399	7HK 4 3HKs 5	
660	6DOsw4 M 2QBvw4 2FCvw2a	1401	10HKw 3a Lc	
672	6DOsw4 M 3DAvw4 1FCvw2b	1637	10RKs 5 M	
1385	10HL 3a	1639	7DSw5 3DAvw5	
1395	6DSw6 2SCvw1b 2DCs 4	1648	10DAvw4	



Figure 5: Terrestrial Ecosystem Conservation Rankings: Mt. Maxwell Ecological Reserve

Map Revision Date: October 26, 2007
 Project ID: 07.0077
 Map Scale: 1:20,000

4.4 Ruckle and Beaver Point Provincial Parks and Cusheon Cove Addition

4.4.1 Background

Ruckle Provincial Park was generously donated by the Ruckle family in 1974 (Morris 1986), members of which still reside on the site and manage their historic farm. Some parts of the park are still actively farmed by the Ruckle family and their staff, including pasture, orchards, and barns for cattle. This Park protects valuable and fragile shoreline habitat, as well as cleared and extant forests, rocky outcrops, small oak meadows, and riparian ecosystems. The Cusheon Cove Addition includes a small section whose ecosystem polygons partially overlap with those of Ruckle Provincial Park at the northern end (see Figure 6).

Preserving and interpreting the historic and cultural values are dominant management objectives of this park (Morris 1986). The camping facility on the beach and other recreational opportunities are also listed as key management objectives. These priorities are discussed in more detail later in this section with respect to representation of natural plant communities, invasive species, and the conservation ranking.

4.4.2 Mapped Ecosystems

Ruckle and Beaver Point Provincial Parks and Cusheon Cove Addition contain a very diverse patchwork of ecosystems and anthropogenic sites. There are Douglas-fir-dominated second-growth forests (predominantly structural stage 5), with differing presence and proportion of other species depending on soil moisture and nutrient regimes. Riparian (freshwater) sites and polygons with fluctuating water tables in Ruckle Provincial Park frequently were distinguished by their major components of hardwoods (red alder and bigleaf maple).

Glaciomarine sediments were the dominant surficial material in the area, except in the westernmost part (Beaver Point Provincial Park) and the Cusheon Cove Addition. Here, till was more prevalent, as well as on the elevated rocky hummocks. The glaciomarine deposits form relatively rich soils, with moderate to imperfect drainage. In more well-drained or drier sites (either due to shallow soils, slope, or southern aspect), sporadic Garry oaks and small cohorts grew. Wetter sites either supported Western redcedar - vanillaleaf (CDFmm/12) or Western redcedar - Indian-plum (CDFmm/13), and on sites with better drainage, Western redcedar - Foamflower (CDFmm/06). Douglas-fir - Arbutus forests (CDFmm/02) were more or less restricted to the shoreline areas, with extremely thin soils.

On till, zonal sites and the diagnostic site series (Douglas-fir - Salal, CDFmm/01) occurred, particularly on sloping sites. Rocky hummocks and relatively steep, rocky sites were often small components within polygons mapped in association with a mixture of Douglas-fir - Arbutus and non-forested Selaginella - Cladina plant communities (CDFmm/00). Around the southern end of Beaver Point, towards the small bay and scattered along the shoreline, Douglas-fir - Oniongrass, Douglas-fir - Garry oak, and Garry oak - Arbutus woodland ecosystems (CDFmm/03:Coniferous dominant, CDFmm/03:Mixed, and CDFmm/03:Broadleaf dominant, respectively) occurred among non-vegetated rock shelves.

The homestead, heavily modified sites (grassy picnic sites and campground), and farm areas were mapped as rural, cultivated fields, orchards, and cleared forests, where applicable. Given the management objectives of the Park, it is unlikely that the native ecosystems that would otherwise occupy these sites will recur in the short- to medium-term and they will retain their present character.

Rare Plant Communities

Stands mapped as CDFmm/03 (TEM code DO (Douglas-fir – Oniongrass)) with a significant broadleaf (Garry oak) component (>25% of the canopy) are likely to contain rare species and should be treated as rare plant communities. This ecosystem was mapped in Ruckle Provincial Park (polygon #s: 388 and 411). Almost all mature (structural stages 5 and 6) forested ecosystems mapped within this park have the potential to support blue and red-listed plant communities. Some of the areas most likely to support rare plant communities include: polygon #537 containing 60% DS stage 6, 30% DA stage 6 and 10% SC 1b; polygon #540 containing 50% RK stage 6, polygon # 1691 containing 50% DG stage 6 (located at the northern section of Ruckle Park). All of these polygons are ranked as having high to very high conservation values (Figure 6). Refer to individual ecosystem descriptions in Section 3.2 for more details. Also, a list of plant communities at risk in the CDFmm and CWHxm1 is included as Appendix III.

Other polygons likely to contain rare species and rare plant communities are those shoreline areas with little to no disturbance associated with rock outcrops (polygon #s: 329, 362, and 1687). These sites are often mapped as sensitive ecosystems (SEI polygons).

Rare Species

Appendix II provides a list of red and blue-listed species potentially occurring in CDFmm and CWHxm1, as well as information on known element occurrence (EOs)

records for Parks, Ecological Reserves and surrounding areas on Salt Spring Island (BC Conservation Data Centre 2007). Each study area has a different character and location and contains a different suite of ecosystems, therefore each must be evaluated separately to determine which species it is likely to support.

Known rare plants for Ruckle Provincial Park (no records for Beaver Point Provincial Park or Cusheon Cove Addition to date) include: Greensheathed Sedge (*Carex feta*) (red-listed) and Macoun's meadow-foam (*Limnanthes macounii*) (red-listed). Five subpopulations of Macoun's meadow-foam are located at Beaver Point (in Ruckle Park) in seepage sites, pools and ditches near the shoreline at the campsite. Refer to Appendix II for further details on these element occurrence records (BC CDC 2007). Other CDC records that have not yet been mapped, but are known to occur within Ruckle Park include: dune bentgrass (*Agrostis pallens*) (blue-listed) and Western pearlwort (*Sagina decumbens* ssp. *occidentalis*) (blue-listed).

The Dun Skipper (*Euphyes vestries*) (blue-listed) and Moss' Elfin (*Callophrys mossii mossii*) (blue-listed) are known to occur in the general vicinity of the park (off of Beaver Point Road). These rare butterfly species and others are likely to occur in the park as well. Records of Western Screech-owls (blue-listed) exist for Ruckle Park, with the last confirmed nesting observation in 1993 (BC CDC 2007). In addition, Barn Owls (blue-listed) have nested west of the park boundary in a natural cavity in a snag, with the last record for the area in 1991 (BC CDC 2007). In addition, there is one historical record of a Bald Eagle nest on Beaver Point (Figure 6, see bird symbols).

4.4.3 Disturbance

From an ecosystem management perspective, the agricultural use of the farm, the maintenance of the campground/picnic area, and the existence of the road constitute disturbances and contribute to increased fragmentation of adjacent polygons that contain native ecosystems. However, these values are secondary to the historical and cultural values emphasized in the park management plan (Morris 1986). There is still a relatively large area of natural vegetation surrounding this core area that supports viable ecosystems and indigenous species, although most of the Douglas-fir and western redcedar forest types do show evidence of historic logging.

Trampling of the native vegetation is an issue in this popular park. Although there is an established trail network, off-trail mountain bike riding, and hiking have compacted soil and damaged plants, especially around the shoreline trail and in the vicinity of the campsites. The campsite is also known to contain some sensitive

vernal pool microhabitats with rare species occurrences that are highly susceptible to damage.

4.4.4 *Invasive species*

The anthropogenic sites all contain invasive species, including grasses, Scotch broom, and many other herbaceous species that provide a source of propagules to the adjacent polygons. The sheep, cattle, and other livestock on the farm all potentially spread seed as it sticks to their coats or germinates in their droppings. The road and trails also act as vectors for dispersal. The recent attention to carpet burweed's rapid spread and attempted eradication in this park is but one instance that highlights the network of factors influencing the dispersal and colonization of invasive species in this Park which is heavily used by visitors.

4.4.5 *Conservation Assessment and Ranking*

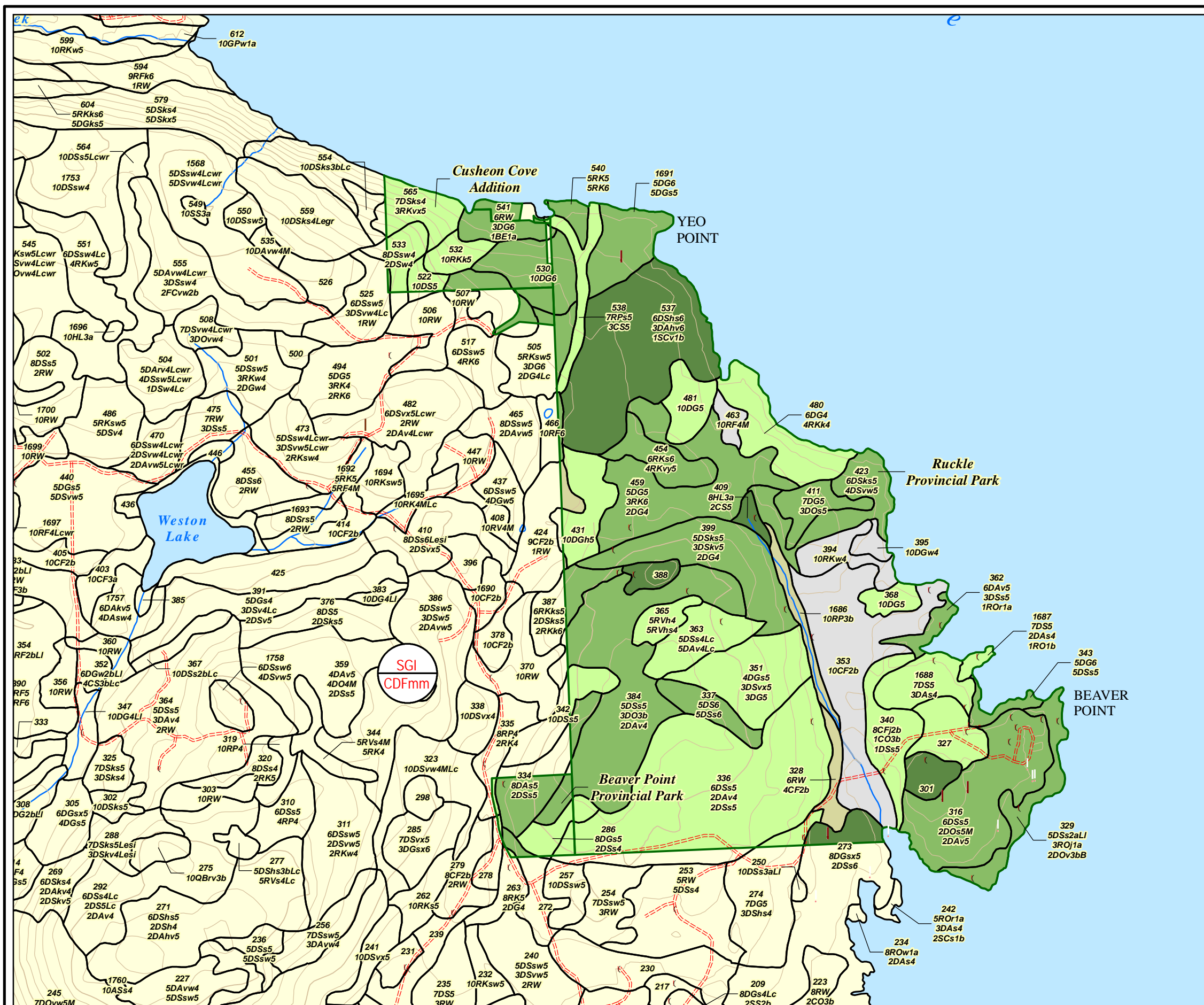
Ruckle and Beaver Point Provincial Parks and Cusheon Cove Addition contain fewer highly ranked polygons than most of the other parks due to its dominant uses as farmland and campground (Figure 6 and Appendix XI). Cleared sites and fields have lower rankings, although the seasonally flooded poorly drained fields that are found in this Park have somewhat higher rankings based on their capacity to provide migratory bird habitat. The older forests, meadows, and shoreline bluffs, polygons with Garry oak and rocky hummocks with very shallow soils all ranked high. Young forests had intermediate rankings, while those with fluctuating water tables and riparian polygons were ranked slightly higher.

4.4.6 *Wildlife Observations*

The variety of habitats protected by Ruckle and Beaver Point Provincial Parks and Cusheon Cove Addition results in a high diversity of species that use its components. Seabirds, ducks, geese, and shorebirds were observed in the intertidal and marine area, while Great Blue Herons (blue-listed) and Bald Eagles were observed using trees in the riparian and shoreline zones. Numerous passerines use the area, many of which were seen and heard during ecosystem surveys (e.g., Townsend's Solitaire, Violet-green Swallow, Barn Swallow, Pine Grosbeak, several Finch and Sparrow species, Common Raven, Northwestern Crow, American Robin, Chestnut-backed Chickadee).

A Red-tailed Hawk was observed in the forest adjacent to the lower parking lot during ecosystem surveys in 2007 and is likely breeding within or adjacent to the park. Historical nest records for Western Screech-owl (blue-listed) and Bald Eagles

exist within the park (see Figure 6). A barn was inspected for signs of Barn Owl use, but appeared unused, although the habitat was suitable. Barn Owls (blue-listed) have also been recorded breeding in the area west of the park boundary. Black-tailed deer sign was observed throughout the area, especially in the second-growth forests. The ditches in the flooded fields, as well as the riparian areas, are suitable habitat for shrews and red-legged frogs.



ECOSECTION & BIOGEOCLIMATIC UNITS		ECOSYSTEM UNIT LABEL		
	Ecosection		Site Modifier	
	Biogeoclimatic Unit		Disturbance Code	
			Ecosystem Unit	
			Stand Composition	
			Structural Stage	
MAP SYMBOLS				
	Road		Plot Location - Maxwell TEM (2003)	
	Rivers & Creeks - Definite		Plot Location - CDF TEM (2007)	
	Rivers & Creeks - Indefinite		Rare Bird	
	Biogeoclimatic Unit		Rare Plant	
	Ecosystem Unit		Rare Plant Community (Forest)	
	Parks & Ecological Reserves		Rare Plant Community (Oak)	
			Very High	
			High	
			Moderate	
			Low	
			Very Low	
ECOSECTION & BIOGEOCLIMATIC UNITS				
Ecosections: SGI: Southern Gulf Islands		Biogeoclimatic Units: CDFmm: Coastal Douglas-Fir zone, moist maritime subzone; CWHxm1: Coastal Western Hemlock zone, very dry maritime subzone, eastern variant		
ECOSYSTEM UNITS MAPPED IN THE CDFmm				
Site Code	Description	Site Series	Assumed Modifiers	Soil Moisture Regime
CS	Western redcedar - Sough sedge	14	d, j, m	subhydic
DA	Douglas-fir - Shore pine - Arbutus	02	d, j, m, r	xeric
DO	Douglas-fir - Grand fir - Oregon grape	04	d, j, m	subxeric - mesic
DG	Douglas-fir - Oniongrass	03	d, m, r	xeric
DS	Douglas-fir - Salal	01	d, j, m	subxeric - mesic
FC	Fescue - Camas	00	j, m, s	subxeric
GO	Garry oak - Oceanspray	00	j, m, r	xeric - subxeric
HL	Hardhack - Labrador tea	00	d, j, p	subhydic
QB	Garry oak-Brome/mixed grasses	00	j, m, r	xeric - subxeric
RF	Western redcedar - Grand fir - Foamflower	06	d, j, m	subhydic - hygric
RK	Western redcedar - Douglas-fir - Oregon beaked moss	05	d, j, m	subhydic - hygric
RP	Western redcedar - Indian-plum	13	d, j, m	hygric
RS	Western redcedar - Showberry	07	a, d, j, m	subhydic - hygric
RV	Western redcedar - Vanilla-leaf	12	d, j, m	subhydic
SC	Cladina - Wallace's selaginella	00	j, m, r, v	subxeric
ECOSYSTEM UNITS MAPPED IN THE CWHxm1				
Site Code	Description	Site Series	Assumed Modifiers	Soil Moisture Regime
AM	Arbutus - Hairy manzanita	00	j, r, s	xeric
DC	Douglas-fir - Shore pine-Cladina	02	d, j, m	very xeric
DF	Douglas-fir - Sword fern	04	d, j, m	xeric - subxeric
DS	Douglas-fir - Western hemlock - Salal	03	d, j, m	xeric - subxeric
HD	Western hemlock - Western redcedar - Deer fern	06	d, j, m	subhydic - hygric
HK	Douglas-fir - Western hemlock - Oregon beaked moss	01	d, j, m	submesic - mesic
HL	Hardhack - Labrador tea	00	d, j, p	subhydic
RF	Western redcedar - Grand fir - Foamflower	07	d, j, m	subhydic - hygric
RS	Western redcedar - Swordfern	05	d, j, m	submesic - mesic
SC	Cladina - Wallace's selaginella	00	j, m, r, v	very xeric
ANTHROPOGENIC AND SPARSELY VEGETATED UNITS				
Site Code	Description	Site Code	Description	
BE	beach	ES	exposed soil	
CF	cultivated field	GP	gravel pit	
CL	cliff	RO	rock outcrop	
CO	cultivated orchard	RW	rural developed	
STEMODIFIERS (Atypical Conditions)				
Code	Topography			
g	gully: occurs within a gully, or with gully throughout the delineated area			
h	hummocky terrain: indicated by the terrain surface expression			
j	gentle slope: < 35% in the CWH and CDF zones			
k	cool aspect: occurs on aspects 285°-357°, on moderately steep slopes (35%-100% in the CWH and CDF)			
q	very steep cool aspect-very steep slopes (< 100%) with aspects 285°-357°			
r	ridge: occurs throughout an area of ridged terrain, or on a ridge crest			
w	warm aspect: 135°-285°, on moderately steep slopes (35%-100% slope in the CWH and CDF zones)			
z	very steep warm aspect-slopes > 100% on aspects 135°-285°			
Code	Moisture			
x	drier than typical			
y	moister than typical			
Code	Soil			
v	very shallow soils: < 20 cm to bedrock			
STRUCTURAL STAGE & STRUCTURAL STAGE MODIFIERS				
Code	Structural Stage			
1	Sparse/bryoid bryophytes and lichens dominant, may reflect recent disturbance; Sparse (1a) bare rock or ground (< 10% vegetation cover) / Bryoid (1b) bryophytes and lichens dominant			
2	Herb some invading or residual shrubs and trees may be present, may reflect recent disturbance; Forb-dominated (2a) includes non-graminoid herbs and ferns; Graminoid-dominated (2b) grasses, sedges, rushes, reeds; Aquatic herbs (2c) dominate the site with standing water or submerged			
3	Shrub Early successional stage or maintained by environmental conditions or disturbance Low shrub (3a) < 2 m tall / Tall shrub (3b) 2-10 m tall			
4	Pole/Sapling Trees > 10 m tall, often densely stocked, no vertical canopy structure, typically < 40 years since disturbance			
5	Young Forest Self-thinning and canopy differentiation initiated, typically 40-80 years since disturbance			
6	Mature Forest Mature tree canopy, typically 80-250 years since disturbance			
7	Old Forest Structurally complex stands comprised mainly of shade-tolerant and regenerating tree species; snags and coarse woody debris and patchy understories, typically > 250 years since disturbance.			
Code	Stand Composition Modifiers			
B	broadleaf (> 75% of stand)			
C	conifer (> 75% of stand)			
M	mixed (neither comprises > 75% of stand)			
DISTURBANCE CLASSES AND MODIFIERS				
B	Biotic Disturbances			
d	§ Domestic grazing/browsing			
L	Forest Harvesting			
c	§ clearcut system	e	§ selection system	
wr	○ with reserves (patch retention)	gr	○ group selection	
d	§ seed tree system	si	○ single tree	
gr	○ grouped	l	§ land clearing	
ADDITIONAL ECOSYSTEM LABELS				
301	7DSs5 3SC1b	327	5DSs4Lcwr 3RW 2DAv4	
388	10DOr4B			

Figure 6: Terrestrial Ecosystem Conservation Rankings: Ruckle and Beaver Point Provincial Parks and Cusheon Cove Addition

Map Revision Date: October 26, 2007
 Project ID: 07.0077
 Map Scale: 1:20,000



4.5 Mount Erskine Park

4.5.1 Background

Mount Erskine Provincial Park, comprising approximately 107 hectares, was established as a Class A, Category 1, Schedule C Provincial Park on December 1, 2006 by an Order-in-Council under the *Park Act*. The establishment of Mount Erskine Provincial Park is the result of dedicated efforts by a number of groups and individuals to preserve this unique area on Salt Spring Island. One of the three lots comprising the Park was purchased by the Salt Spring Island Conservancy (60%), the Nature Conservancy of Canada (20%), and the Provincial Government (20%) and is managed as a Provincial Park under a 99-year lease arrangement. The other two lots were provincial crown lands that were included in the Park at time of establishment and were intended to be managed as a unit with the leased land. As with the *Park Act* category designation, the terms of the Lease are fundamental to the management of Mount Erskine Park (MoE, BC Parks Draft Management Plan, September 2007).

4.5.2 Mapped Ecosystems

Mount Erskine Provincial Park supports a unique series of habitat types that have very restricted distribution on Salt Spring Island. The complex geology of this formation underlies some uncommon ecosystem types. All but the westernmost side (approximately 10% of the area) is within the Coastal Western Hemlock biogeoclimatic zone, very dry maritime subzone, eastern variant (CWHxm1).

Shore pine, a coastal variety of lodgepole pine, is found on the higher water-shedding, extremely dry site types, typically in combination with Douglas-fir. These shallow soils also are highly susceptible to disturbance, since they are typically friable and take a long time to recover from damage since soil accumulation is slow. The driest sites contained some oceanspray, but more commonly contained drought-tolerant species including kinnickinnick, various moss and lichen species, and bare rock outcrops.

Below the crest and upper slope, soil depth increases and supports more productive ecosystems with taller, more continuous vegetation cover. The predominant ecosystem types are the dry Douglas-fir–Western hemlock–Salal forests (TEM code DS, site series 03) on well-drained, moisture-shedding south slopes, and the Douglas-fir – Western hemlock – Oregon beaked moss (TEM code HK, site series 01) association on gentler slopes.

On Mt. Erskine, however, moisture-requiring hemlock is sparse, especially on steeper sites, due to the warm aspect and shallow soils. Therefore, most ecosystems, particularly along the transition between the two climatic zones, presently support a similar flora, with Douglas-fir dominating the canopy and salal and oceanspray in the understorey, and step moss the dominant bryophyte.

The very small section of the park in the CDFmm is characterized largely by Douglas-fir and western redcedar forests, occasionally with grand fir. It is only weakly distinct from the CWHxm1 in terms of species presence and abundance, due to the moderate slope, and hence climatic, gradient. The polygon with the riparian corridor (small section in the southwestern corner of the park) supports western redcedar, with some grand fir and mixed red alder and bigleaf maple. Salal is also frequent in the understorey, most typically on well-drained sites. Other common understorey species include sword fern, salmonberry (in the riparian site), and tall Oregon-grape.

Rare Plant Communities

The Arbutus–Hairy Manzanita (TEM code AM) association is a red-listed plant community that occurs on the uppermost elevation of the park (polygon #1545), and where steep, rocky, south aspects with very shallow soils are present. This association has a high likelihood of containing rare vascular and non-vascular plant species as well as rare invertebrates and vertebrates. Stonecrop, various drought-tolerant mosses, and lichens are common ground cover.

Almost all mature (structural stages 5 and 6) forested ecosystems mapped within this park have the potential to support blue and red-listed plant communities. Some of the areas most likely to support rare plant communities include: polygon #1532 containing 60% DS stage 5 and 40% DS stage 6; polygon #1526 containing 100% DS stage 6; and polygon #782 containing 70% DS stage 5 and 30% RK stage 6 (this last polygon is a small section of a much larger one adjacent to the southwestern corner of the park and contains riparian habitat). All of these polygons are ranked as having high to very high conservation values (Figure 7). Refer to individual ecosystem descriptions in Section 3.2 for more details. A complete list of plant communities at risk in the CDFmm and CWHxm1 is included as Appendix III.

Rare Species

Appendix II provides a list of red and blue-listed species potentially occurring in CDFmm and CWHxm1, as well as information on known element occurrence (EOs) records for Parks, Ecological Reserves and surrounding areas on Salt Spring Island (BC Conservation Data Centre 2007). Each study area has a different character and

location and contains a different suite of ecosystems, therefore each must be evaluated separately to determine which species it is likely to support.

Very few records of rare species exist for this park. This is may be due to the steep nature of the park, which limits access for inventory. Dr. Adolf Ceska considers the lack of rare plants to be due to the absence of rich soils (underlying parent material does not support rich microsites compared to areas like Mt. Maxwell Ecological Reserve and Provincial Park) (pers. comm.). During rare plant surveys in 2005, Dr. Ceska did not observe any rare plants in the areas surveyed. A complete list of the plants observed during surveys by Ceska in 2005 is provided in Appendix VII (organized alphabetically by common and scientific names).

The BC CDC has records of two patches of 40 seedlings of California hedge-parsley (*Yabea microcarpa*) (red-listed) on Mt. Erskine point on open rock outcrops on the margin of Garry oak stands, on steep slopes above the ocean (BC CDC 2007). The data provided for this element occurrence did not have a level of accuracy associated with it for mapping purposes (i.e., is not shown on Figure 7).

4.5.3 Disturbance

Development adjacent to Mount Erskine has disturbed some of the ecosystems along the western flank of the property. To the east, there are relatively large logged areas. To the south, the next developed areas are several hundred metres or so away, buffering the effects of the disturbance. Some historic fire scars were evident on mature Douglas-fir trees in the forest below the rocky crest.

The terrain of Mt. Erskine also influences the level of disturbance. More gentle terrain is more attractive to recreational users. The access and lack of facilities also limits the number of visitors and their activities to wildlife watching and hiking. Park trails constitute the main anthropogenic feature within the park. Some are showing signs of erosion as people expand the footprint to avoid wet or muddy spots. Along sections of the trails, some tree roots are being impacted as well, but the highly localized nature of this disturbance may not lead to any detrimental effects overall. There was some litter on the trail from the roadway up to the park, although technically this was not within the park itself.

4.5.4 Invasive species

Invasive plant species are a widespread and ever-growing threat to the integrity of natural ecological communities. The grassy microsites on rock outcrops, on the meadow microsites to the northeast of the summit, and within the Arbutus–Hairy

Manzanita polygons did contain invasive grasses, albeit a relatively low percentage. Nearer to the road, and within the CDFmm, invasive species were more abundant, typically hairy cat's ear, grasses, foxglove, ivy, and holly. The relatively isolated nature of the park buffers it from the constant inputs of propagules that bombard polygons adjacent to roadways and habitations.

There were relatively few invasive species observed in Mt. Erskine Provincial Park. The rugged terrain and typically low productivity forests limit human disturbance and preclude factors such as cattle grazing, seed transfer, and intensive human modification.

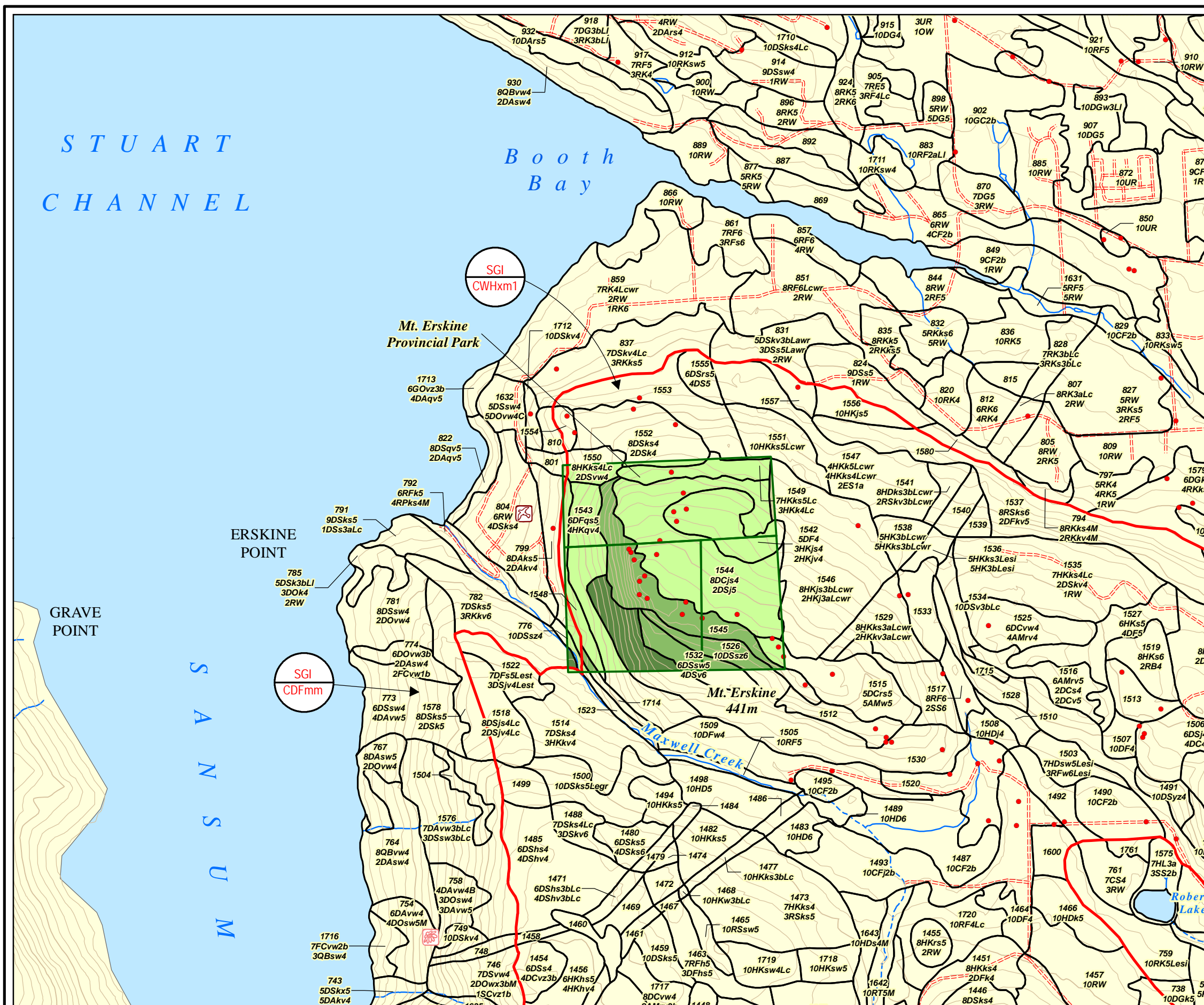
4.5.5 Conservation Assessment and Ranking

The most sensitive ecosystems, as described above, were those with the oldest undisturbed age class forests, those with a component of herbaceous meadows, and the steep cliffs. Terrestrial herbaceous rock outcrops were present, but were so intermingled with forested and the Arbutus–Hairy Manzanita site types that they were not separated into discrete polygons. These ecosystem types, supported by very shallow soils, also ranked highly. The remaining ecosystems grouped into a less sensitive class, with little differentiation among them. Forests with thicker forest floors and underlying mineral soil are more resilient to disturbance. The harvested areas included in and bordering the eastern section of the park reduced the ranks for those polygons due to the effects of disturbance and fragmentation (Figure 7 and Appendix XI).

4.5.6 Wildlife Observations

Many of the polygons in the area supported adequate browse for ungulates. Deer sign was found in several sites. Indications of birds feeding on insects and invertebrates were also widespread on dry sites; grouse sign was noted in the pine stands. There was moderate bat roosting potential, but tree size was somewhat limiting. Snags and a moderate amount of small-sized coarse woody debris were found in the Douglas-fir–Shore pine forest along the undulating ridge top.

The mature forest along the northern slopes of the park contained an active Northern Flicker cavity, and had high potential for wildlife use. There was a good concentration of snags and suitable cavities: this polygon was rated very high for Northern Pygmy-owl habitat potential. During the first visit to the site, a Northern Pygmy-owl (blue-listed) was heard calling from the forest south of the park.



ECOSECTION & BIOGEOCLIMATIC UNITS		ECOSYSTEM UNIT LABEL		
SGI	Ecosection	Polygon ID	Site Modifier	
CDFmm	Biogeoclimatic Unit	Percentile	Disturbance Code	
		50F5M	Ecosystem Unit	
			Stand Composition	
			Structural Stage	
MAP SYMBOLS				
---	Road	●	Plot Location - Maxwell TEM (2003)	
---	Rivers & Creeks - Definite	●	Plot Location - CDF TEM (2007)	
---	Rivers & Creeks - Indefinite	☒	Rare Bird	
---	Biogeoclimatic Unit	☒	Rare Plant	
---	Ecosection	☒	Rare Plant Community (Forest)	
---	Parks & Ecological Reserves	☒	Rare Plant Community (Oak)	
			Conservation Rank	
			Very High	
			High	
			Moderate	
			Low	
			Very Low	
ECOSECTION & BIOGEOCLIMATIC UNITS				
Ecosections		Biogeoclimatic Units		
SGI: Southern Gulf Islands		CDFmm: Coastal Douglas-Fir zone, moist maritime subzone		
		CWHxm1: Coastal Western Hemlock zone, very dry maritime subzone, eastern variant		
ECOSYSTEM UNITS MAPPED IN THE CDFmm				
Site Code	Description	Site Series	Assumed Modifiers	Soil Moisture Regime
CS	Western redcedar - Slough sedge	14	d, j, m	subhygic
DA	Douglas-fir - Shore pine - Arbutus	02	d, j, m, r	xeric
DG	Douglas-fir - Grand fir - Oregon grape	04	d, j, m	subxeric - mesic
DO	Douglas-fir - Oniongrass	03	d, m, r	xeric
DS	Douglas-fir - Salal	01	d, j, m	subxeric - mesic
FC	Fescue - Camas	00	j, m, s	subxeric
GO	Garry oak - Oceanspray	00	j, m, r	xeric - subxeric
HL	Hardhack - Labrador tea	00	d, j, p	subhygic
QB	Garry oak-Brome/mixed grasses	00	j, m, r	xeric - subxeric
RF	Western redcedar - Grand fir - Foamflower	06	d, j, m	subhygic - hygic
RF	Western redcedar - Douglas-fir - Oregon beaked moss	05	d, j, m	subhygic - hygic
RP	Western redcedar - Indian-plum	13	d, j, m	hygic
RS	Western redcedar - Snowberry	07	a, d, j, m	subhygic - hygic
RV	Western redcedar - Vanilla-leaf	12	d, j, m	subhygic
SC	Cladina - Wallace's selaginella	00	j, m, r, v	subxeric
ECOSYSTEM UNITS MAPPED IN THE CWHxm1				
Site Code	Description	Site Series	Assumed Modifiers	Soil Moisture Regime
AM	Arbutus - Hairy manzanita	00	j, r, s	xeric
DC	Douglas-fir - Shore pine-Cladina	02	d, j, m	very xeric
DF	Douglas-fir - Sword fern	04	d, j, m	xeric - subxeric
DS	Douglas-fir - Western hemlock - Salal	03	d, j, m	xeric - subxeric
HD	Western hemlock - Western redcedar - Deer fern	06	d, j, m	subhygic - hygic
HK	Douglas-fir - Western hemlock - Oregon beaked moss	01	d, j, m	submesic - mesic
HL	Hardhack - Labrador tea	00	d, j, p	subhygic
RF	Western redcedar - Grand fir - Foamflower	07	d, j, m	subhygic - hygic
RS	Western redcedar - Swordfern	05	d, j, m	submesic - mesic
SC	Cladina - Wallace's selaginella	00	j, m, r, v	very xeric
ANTHROPOGENIC AND SPARSELY VEGETATED UNITS				
Site Code	Description	Site Code	Description	
BE	beach	ES	exposed soil	
CF	cultivated field	GP	gravel pit	
CL	cliff	RO	rock outcrop	
CO	cultivated orchard	RW	rural developed	
STEMODIFIERS (Atypical Conditions)				
Code	Topography			
g	gullying: occurs within a gully, or with gullying throughout the delineated area			
h	hummocky terrain: indicated by the terrain surface expression			
j	gentle slope: < 35% in the CWH and CDF zones			
k	cool aspect: occurs on aspects 285-335; on moderately steep slopes (35%-100% in the CWH and CDF)			
q	very steep cool aspect-very steep slopes (< 100%) with aspects 285-335			
r	ridge: occurs throughout an area of ridged terrain, or on a ridge crest			
w	warm aspect: 135-285; on moderately steep slopes (35%-100% slope in the CWH and CDF zones)			
z	very steep warm aspect-slopes > 100% on aspects 135-285			
Code	Moisture			
x	drier than typical			
y	moister than typical			
Code	Soil			
v	very shallow soils: < 20 cm to bedrock			
STRUCTURAL STAGE & STRUCTURAL STAGE MODIFIERS				
Code	Structural Stage			
1	Sparse/bryoid bryophytes and lichens dominant, may reflect recent disturbance: Sparse (1a) bare rock or ground (< 10% vegetation cover) / Bryoid (1b) bryophytes and lichens dominant			
2	Herb some invading or residual shrubs and trees may be present, may reflect recent disturbance: Forb-dominated (2a) includes non-graminoid herbs and ferns; Graminoid-dominated (2b) grasses, sedges, rushes, reeds; Aquatic herbs (2c) dominate the site with standing water or submerged			
3	Shrub Early successional stage or maintained by environmental conditions or disturbance			
4	Low shrub (3a) < 2 m tall / Tall shrub (3b) 2-10 m tall			
5	Pole/Sapling Trees > 10 m tall, often densely stocked, no vertical canopy structure, typically < 40 years since disturbance			
6	Young Forest Self-thinning and canopy differentiation initiated, typically 40-80 years since disturbance			
7	Mature Forest Mature tree canopy, typically 80-250 years since disturbance			
8	Old Forest Structurally complex stands comprised mainly of shade-tolerant and regenerating tree species; snags and coarse woody debris and patchy understories, typically > 250 years since disturbance.			
Code	Stand Composition Modifiers			
B	broadleaf (> 75% of stand)			
C	conifer (> 75% of stand)			
M	mixed (neither comprises > 75% of stand)			
DISTURBANCE CLASSES AND MODIFIERS				
Biotic Disturbances				
d	Domestic grazing/browsing			
L	Forest Harvesting		L	Forest Harvesting
c	clearcut system		e	selection system
	with reserves (patch retention)		gr	group selection
d	seed tree system		si	single tree
g	grouped		l	land clearing
ADDITIONAL ECOSYSTEM LABELS				
801	8DSk4Lc 2DSk4Lc	1523	10HDk4Lc	
1548	7RSy5Lc 3RSk4Lc	1545	4AMr4 3DCw4 3CLz	
1553	4HKk4 3HDk5 3HKk5	1714	5HKk25 5CLz1a	

Figure 7: Terrestrial Ecosystem Conservation Rankings: Mount Erskine Provincial Park

Map Revision Date: October 26, 2007
 Project ID: 07.0077
 Map Scale: 1:20,000



4.6 Mount Tuam Ecological Reserve & Adjacent Crown Lands Assessment Areas

4.6.1 Background

This Ecological Reserve was established in 1971 and expanded in 2004 with the objective of conserving the dry CDFmm forests and associated sensitive ecosystems. In conjunction with the Land Conservancy, the area has been expanded, and BC Parks is currently considering additional acquisitions (adjacent Crown Lands assessment areas, Figure 1 and Figure 8). The area is known to contain relatively high concentrations of rare ecosystems and species (Anonymous 2003b). Ecosystem distribution and topography in this area was somewhat similar to the southern aspect of Mount Maxwell Ecological Reserve; this was another location where the biogeoclimatic zone boundary was adjusted in elevation to above 500 m on the steep, dry, south-facing slope after consultation with the Regional Ecologist.

4.6.2 Mapped Ecosystems

The Mount Tuam Ecological Reserve and adjacent Crown Lands assessment areas contained a very interesting assemblage of plant communities, including the very unusual second-growth stands of pure arbutus along the southwestern flank, regenerated after a Douglas-fir forest was harvested on the site (CDFmm/01). The site consisted of extremely thick, well-drained till deposits, intersected with riparian channels and imperfectly drained corridors with abundant red alder and stinging nettle (CDFmm/05).

On the southern and western sides of the upper slopes, large polygons containing mosaics of herbaceous graminoid-dominated meadows (Fescue - Camas, TEM code FC) and scattered medium to large Garry oaks (Garry oak - Brome/mixed grasses, TEM code QB) occurred. The other mapped ecosystem associated with Garry oaks is the Douglas-fir - Oniongrass (TEM code DO), which was also mapped in both the Ecological Reserve and adjacent Crown Lands. The oak communities are described in further detail in the ecosystem descriptions (Section 3.2). Red and blue-listed species are frequently found in these ecosystem types, by virtue of their ecologically restricted niches and the limited spatial extent of these ecosystems.

Lower slopes and the southern part of the Ecological Reserve and Adjacent Crown Lands assessment areas supported young to mature second-growth stands of the Douglas-fir-Salal (CDFmm/01) ecosystem and Western redcedar / Douglas-fir - Oregon beaked moss (CDFmm/05) on wetter sites. There were several substantial riparian areas within the Ecological Reserve, mapped as high and middle floodplain benches for the steep and gentle reaches, respectively, often adjacent to or

intermingled with, fluctuating water table sites where soils showed some mottling and corresponding indicator plants.

Rare Plant Communities

Mount Tuam Ecological Reserve contains significant stands of Garry oak. As mentioned above, TEM map codes associated with Garry oak mapped in this area include the QB (Garry oak-brome/mixed grasses) and DO (Douglas-fir – Oniongrass, site series 03). These ecosystems should be considered to be red-listed plant communities. For example, polygon #15 contains 50% QB (Garry oak – brome/mixed grasses) (located within the Crown Lands assessment area). This polygon is also associated with numerous records of red-listed plant species (see Figure 8). There are many additional polygons of significance in this area, all indicated by high and very high conservation value rankings (Figure 8).

In addition to Garry oak stands, almost all mature (structural stages 5 and 6) coniferous and mixed forested ecosystems mapped within this Ecological Reserve and the adjacent Crown Lands have the potential to support blue and red-listed plant communities. These polygons are ranked as having high to very high conservation values (Figure 8). The red-listed Douglas-fir – Arbutus, Douglas-fir / dull Oregon-grape, and Wester redcedar / vanilla leaf plant communities have been confirmed in the Ecological Reserve (BC CDC 2007). A complete list of plant communities at risk in the CDFmm and CWHxm1 is included as Appendix III.

Rare Species

Appendix II provides a list of red and blue-listed species potentially occurring in CDFmm and CWHxm1, as well as information on known element occurrence (EOs) records for Parks, Ecological Reserves and surrounding areas on Salt Spring Island (BC Conservation Data Centre 2007). Each study area has a different character and location and contains a different suite of ecosystems, therefore each must be evaluated separately to determine which species it is likely to support.

Four red-listed plant species were found in these polygons during rare plant surveys in April of 2007 (Appendix IV and IX). One of these species was a healthy population of the red-listed (Threatened status May 2002 under Species At Risk Act) Yellow Montane Violet (*Viola praemorsa*) (Photo 1a). Over 50 plants were noted, mostly occurring along a disturbed stretch of land under the powerline corridor (Figure 7). Other red-listed plants included: California hedge-parsley (*Yabea microcarpa*), small-flowered godetia (*Clarkia purpurea subsp. quadrivulnera*), and scalepod (*Idahoia scapigera*) (Appendix IV).

Additional surveys were conducted through the Salt Spring Island Conservancy (data collected by Hans Roemer in 2007 is not included in this report). Some seepage sites were also present, supporting yellow monkey flower (Photo 1b) and bryophytes. Rock outcrops, with and without moss and lichen colonization, were interspersed throughout these meadows. Seepage sites and rock outcrops in the CDF are often associated with the occurrence of rare plants.



Photo 1: (1a - left) Yellow montane violet (red-listed), (1b - right) monkey flower growing in seepage site.

In addition to rare plants, the blue-listed butterfly *Propertius Duskywing* (*Erynnis propertius*) were observed on April 19th among the Garry oak patches and leaf litter of ecosystem polygons 15 and 16 (Figure 8, Photo 2). A total of three adults were seen while traversing the area to collect ecosystem information. The BC CDC has other observations of this species for the area in their records from 1995 (13 males and 2 females in an oak stand) (BC CDC 2007). Other butterfly records for the area from CDC include: *Zerene Fritillary* (*Speyeria zerene bremnerii*) (red-listed). This species was observed in 1995 by S. Ansell, with the main population consisting of 140+ males and 5 females found just south of the summit on an open grassy slope with a few mature Douglas-fir (BC CDC 2007).



Photo 2: Propertius Duskywing (*Erynnis propertius*) observed at Mt. Tuam Ecological Reserve and Adjacent Crown Land Parcels in April of 2007.

4.6.3 Disturbance

There is a powerline right-of-way leading from the road upslope, through several oak meadow polygons, past the top of the area. This only constituted a disturbance (aside from the negligible area displaced by the footprint) in the lower forested slope where a corridor had been cleared and was periodically brushed. No trails were evident in this Ecological Reserve, likely due in part to the steep nature of the site. The gravel road receives relatively little traffic and does not constitute a major disturbance for this Ecological Reserve or the adjacent Crown Lands assessment areas (Figure 8).

A small herd of feral sheep was observed during the field assessment. Several of the meadow polygons were severely grazed by the sheep, which likely detrimentally affects the long-term persistence and dispersal capacity of some species.

The historic and present fire regimes may be a disturbance factor worth considering in this Ecological Reserve. As described earlier, natural and anthropogenic fires have played historic roles to influence the development, persistence, and health of Garry oak and terrestrial herbaceous ecosystems. Fire suppression over the past century has likely led to changes in species composition of communities, but this is difficult to determine for this site in particular, lacking historic data. There was a large Fescue-Camas meadow with no ingress of any tree species on the southwest upper slope. This may be an edaphic climax for this site. As noted above, past logging of a second-growth Douglas-fir forest on the western slope has resulted in a dense stand comprised entirely of arbutus.

4.6.4 *Invasive species*

Mount Tuam Ecological Reserve had relatively few invasive species. The herbaceous meadows and graminoid-dominated sites did contain up to 25% exotic grasses, such as hedgehog dogtail and sweet vernalgrass, but overall most polygons had 0-5% invasive species. The feral sheep mentioned earlier were also possible causes of elevated levels of invasive species in these isolated, otherwise intact, meadow polygons. Foxglove and Scotch broom were found by the roadside.

4.6.5 *Conservation Assessment and Ranking*

Polygons in this area were ranked almost uniformly high to very high (Figure 8 and Appendix XI). This is because of the relatively large polygons, contiguous, non-fragmented ecosystems, and abundant Garry oak and herbaceous meadow ecosystems. Shallow soils along the upper slopes also increased the sensitivity ratings. Historic disturbance of the area was also restricted to more productive forested sites, which only comprise a limited proportion of the total area. The abundance of rare plant species found in this area also yielded high rankings.

4.6.6 *Wildlife Observations*

The Mount Tuam Ecological Reserve and adjacent Crown Lands assessment areas contain potential habitat for Sharp-tailed Snake (red-listed) throughout the herbaceous meadows and south-facing Garry oak ecosystems where rock outcrops and talus occur. The area contained a good distribution of large veteran Douglas-fir snags that are suitable perching and roosting habitat for raptors. Native red squirrel caches of Douglas-fir cones were noted. The meadow polygons are suitable habitat for small mammals such as field mice, voles, and shrews. Sign of deer browse and pellets were also observed. Mt. Erskine Provincial Park provides ideal habitats for numerous resident and migratory birds.



ECOSECTION & BIOGEOCLIMATIC UNITS		ECOSYSTEM UNIT LABEL	
	Ecosection		Polygon ID
	Biogeoclimatic Unit		Site Modifier
	Road (Paved)		Disturbance Code
	Road (Gravel)		Ecosystem Unit
	Rivers & Creeks - Definite		Stand Composition
	Rivers & Creeks - Indefinite		Structural Stage
	Biogeoclimatic Unit		
	Ecological Reserves		
	Crown Lands Assessment Areas		

MAP SYMBOLS		Conservation Rank	
	Plot Location - Maxwell TEM (2003)		Very High
	Plot Location - CDF TEM (2007)		High
	Rare Bird		Moderate
	Rare Plant		Low
	Rare Plant Community (Forest)		Very Low
	Rare Plant Community (Oak)		
	Rare Butterfly		

ECOSECTION & BIOGEOCLIMATIC UNITS	
SGI: Southern Gulf Islands	CDFmm: Coastal Douglas-Fir zone, moist maritime subzone
	CWHxm1: Coastal Western Hemlock zone, very dry maritime subzone, eastern variant

ECOSYSTEM UNITS MAPPED IN THE CDFmm				
Site Code	Description	Site Series	Assumed Modifiers	Soil Moisture Regime
CS	Western redcedar - Sough sedge	02	d, j, m	subhygric
DA	Douglas-fir - Shore pine - Arbutus	14	d, j, m, r	xeric
DO	Douglas-fir - Grand fir - Oregon grape	04	d, j, m	subseric - mesic
DG	Douglas-fir - Oniongrass	03	d, m, r	xeric
DS	Douglas-fir - Salal	01	d, j, m	subseric - mesic
FC	Fescue - Camas	00	j, m, s	subseric
GO	Garry oak - Oceanspray	00	j, m, r	xeric - subseric
HL	Hardhack - Labrador tea	00	d, j, p	subhygric
QB	Garry oak-Brome/mixed grasses	00	j, m, r	xeric - subseric
RF	Western redcedar - Grand fir - Foamflower	06	d, j, m	subhygric - hygric
RK	Western redcedar - Douglas-fir - Oregon beaked moss	05	d, j, m	subhygric - hygric
RP	Western redcedar - Indian-plum	13	d, j, m	hygric
RS	Western redcedar - Snowberry	07	a, d, j, m	subhygric - hygric
RV	Western redcedar - Vanilla-leaf	12	d, j, m	subhygric
SC	Ciadina - Wallace's selaginella	00	j, m, r, v	subseric

ECOSYSTEM UNITS MAPPED IN THE CWHxm1				
Site Code	Description	Site Series	Assumed Modifiers	Soil Moisture Regime
AM	Arbutus - Hairy manzanita	00	j, r, s	xeric
DC	Douglas-fir - Shore pine-Ciadina	02	d, j, m	very xeric
DF	Douglas-fir - Sword fern	04	d, j, m	xeric - subseric
DS	Douglas-fir - Western hemlock - Salal	03	d, j, m	xeric - subseric
HD	Western hemlock - Western redcedar - Deer fern	06	d, j, m	subhygric - hygric
HK	Douglas-fir - Western hemlock - Oregon beaked moss	01	d, j, m	submesic - mesic
HL	Hardhack - Labrador tea	00	d, j, p	subhygric
RF	Western redcedar - Grand fir - Foamflower	07	d, j, m	subhygric - hygric
RS	Western redcedar - Sworferen	05	d, j, m	submesic - mesic
SC	Ciadina - Wallace's selaginella	00	j, m, r, v	very xeric

ANTHROPOGENIC AND SPARSELY VEGETATED UNITS			
Site Code	Description	Site Code	Description
BE	beach	ES	exposed soil
CF	cultivated field	GP	gravel pit
CL	cliff	RO	rock outcrop
CO	cultivated orchard	RW	rural developed

STEMODIFIERS (Atypical Conditions)	
Code	Description
g	gully: occurs within a gully, or with gully throughout the delineated area
h	hummocky terrain: indicated by the terrain surface expression
j	gentle slope: < 35% in the CWH and CDF zones
k	cool aspect: occurs on aspects 285-135, on moderately steep slopes (35%-100% in the CWH and CDF)
q	very steep cool aspect-very steep slopes (< 100%) with aspects 285-135
r	ridge: occurs throughout an area of ridged terrain, or on a ridge crest
w	warm aspect: 135-285, on moderately steep slopes (35%-100% slope in the CWH and CDF zones)
z	very steep warm aspect-slopes > 100% on aspects 135-285
Moisture	
x	drier than typical
y	moister than typical
Soil	
v	very shallow soils: < 20 cm to bedrock

STRUCTURAL STAGE & STRUCTURAL STAGE MODIFIERS	
Code	Description
1	Sparse/bryoid bryophytes and lichens dominant, may reflect recent disturbance; Sparse (1a) bare rock or ground (< 10% vegetation cover) / Bryoid (1b) bryophytes and lichens dominant
2	Herb some invading or residual shrubs and trees may be present, may reflect recent disturbance; Forb-dominated (2a) includes non-graminoid herbs and ferns; Graminoid-dominated (2b) grasses, sedges, rushes, reeds; Aquatic herbs (2c) dominate the site with standing water or submerged
3	Shrub Early successional stage or maintained by environmental conditions or disturbance Low shrub (3a) < 2 m tall / Tall shrub (3b) 2-10 m tall
4	Pole/Sapling Trees > 10 m tall, often densely stocked, no vertical canopy structure, typically < 40 years since disturbance
5	Young Forest Self-thinning and canopy differentiation initiated, typically 40-80 years since disturbance
6	Mature Forest Mature tree canopy, typically 80-250 years since disturbance
7	Old Forest Structurally complex stands comprised mainly of shade-tolerant and regenerating tree species, snags and coarse woody debris and patchy understories, typically > 250 years since disturbance
Stand Composition Modifiers	
B	broadleaf (> 75% of stand)
C	conifer (> 75% of stand)
M	mixed (neither comprises > 75% of stand)

DISTURBANCE CLASSES AND MODIFIERS			
B	Biotic Disturbances		
d	Domestic grazing/browsing		
L	Forest Harvesting		
c	clearcut system	e	selection system
wr	with reserves (patch retention)	gr	group selection
d	seed tree system	si	single tree
gr	grouped	l	land clearing

ADDITIONAL ECOSYSTEM LABELS			
8	8DAw5 2DAw4	98	4DG5 3DS6 3DSv5
23	6DSw4B 2RSw5B 2RKw5	1741	10DSk5
31	10DSk4	1759	4RKw5 3RKw4 3DSw4

Figure 8: Terrestrial Ecosystem Conservation Rankings: Mount Tuam Ecological Reserve and Adjacent Crown Lands Assessment Areas

Map Revision Date: October 26, 2007
 Project ID: 07.0077
 Map Scale: 1:20,000



5.0 MANAGEMENT RECOMMENDATIONS

The following section attempts to provide management recommendations for each of the study areas to support BC Parks objectives following Best Management Practices and the BC Parks management vision. These recommendations consider the ecological community (including vegetation and wildlife) and condition of the site, the nature and extent of disturbance to plants and wildlife, and assess appropriate park management options. Management recommendations focus on polygons ranked as having moderate to very high conservation values (Figures 3 through 8). Marine ecosystems are not discussed in this report.

5.1 Garry Oak Ecosystems

Throughout their native range, Garry oak ecosystems are in decline (GOERT 2007). Garry oak is a keystone species that serves as an indicator of ecosystem health, habitat for plant and wildlife species at risk, and climate characteristic of the CDFmm (and in atypical cases, very dry and well drained sites in the CWHxm1). Studies have implicated many interacting factors, including fire suppression, displacement by invasive species, changes in the edaphic regime due to human influence, and habitat alienation through land conversion (MacDougall and Turkington 2004; MacDougall et al. 2004). Recommendations for ecosystems currently or with the potential to support Garry oak and associated species are made in the context of these considerations.

5.2 Burgoyne Bay Provincial Park

There is no management plan presently available for Burgoyne Bay Provincial Park (currently in process). The harvested upland forested areas, left to regenerate naturally, will revert to their forest ecosystem types described earlier in this report. Gradually, invasive species cover will decrease as canopy closure shades out these pioneer invasive species that are typically not adapted to later-successional environments. Species with more persistent seed banks, however, such as Scotch broom, may require ongoing monitoring and mitigation, if continued spread is observed.

Should BC Parks decide to manage for preservation of cultural, historic, and heritage values of this homestead and farm site and retain them in their current state, active haying or mowing of the cleared fields, ditch maintenance, and some building maintenance will likely be required (depending on whether public access is permitted within the buildings or not). This management option would support the habitat values provided by ditches, seasonally flooded fields, and buildings. Amphibians

such as red-legged frogs (blue-listed) would have suitable habitat in the ditches, waterfowl including various duck species, Brant's and Canada Geese, and Trumpeter Swans would have seasonal foraging habitat supported by the flooded fields.

Open, graminoid-dominated fields would continue to support rodent populations as presently, which serve as prey for raptors that roost in the adjacent forest edges, and possibly (in the case of Barn Owl) in the abandoned barn. The habitat for passerine birds would not differ from its present condition. The forested areas would continue to support species and habitat types as described above.

If BC Parks determines that all or a portion of the cultivated fields should be restored to its native vegetative state, there are two options to achieve this, depending on whether it is to be accomplished over a short or long time horizon. The short-term approach would be to actively manage the vegetation on site to encourage recolonization of species that would occupy the valley in the absence of the farm (i.e., to restore the original condition as closely as possible). This option, due to the large area and intensive works required, would be very costly and create considerable soil disturbance in the interim. Intensive management to remove invasive species, plant indigenous trees and shrubs, and possibly modify the anthropogenic drainage features would all form part of this process. The site would revert to rich, lowland forested habitat (including forested ecosystems with fluctuating water tables and riparian ecosystems). These ecosystems are described elsewhere in the report with respect to their composition and character. Wildlife values would shift from grassland-type habitat users to forest species, eventually increasing the usage of deer, squirrels, and cavity nesters.

The less disruptive and more gradual means to this end is to adopt a hands-off approach and let natural species ingress into the fields, which would proceed through natural succession over many decades. Depending on habitat niche availability, this may take even longer. The edge habitat would persist and expand as the forests gradually encroach onto the fields and riparian areas, and the fields would likely eventually shift from graminoid-dominated to shrub-dominated. Depending on natural disturbance regimes, this shrub state could persist indefinitely if the canopy is dense enough. Eventually, lowland forest community may develop as described above for the alternative scenario.

There are three major habitat zones in Burgoyne Bay Provincial Park: the shoreline, estuaries, intertidal habitats; the upland forests; and the lowland fields. Riparian areas occur within each. Each zone supports a distinct group of species that changes seasonally. Riparian habitats among the forested areas and fields provide suitable

breeding, foraging, and cover habitat for red-legged frog (blue-listed), great blue heron (blue-listed), and likely several listed plant species, such as purple-leaved willowherb and brook spike-primrose.

The mature forests, and forests developing into mature or old-growth forests, contain habitat attributes that support a number of wildlife species. Attributes such as large branches may serve as nesting platforms, while deep bark crevices provide substrate for arboreal lichens and bryophytes. Sufficiently large trees and snags ensure a source of cavities for primary and secondary cavity nesting species (i.e., woodpeckers, passerines, ducks, owls, bats, and other small mammals). If the younger forested polygons are allowed to regenerate and follow their natural successional pathways, then it is likely that with no effort conservation values and biodiversity will increase over time.

The existing trail network consists largely of unpaved roads. Formalizing the trail system will reduce detrimental impacts caused by trampling by off-trail use. Maintain the existing gate to restrict unauthorized motorized access. Restricting boat access in this area by using marker buoys and erecting an interpretive sign at the boat ramp may minimize ancillary damage. Developing a trail map that would concentrate visitor use to the developed trails would also help preserve this habitat.

Visitor activity in the park is relatively limited at present, especially compared to Mount Maxwell and Ruckle Provincial Parks. Providing minimal facilities for day-use visitors such as a garbage bin, interpretive sign with trail map (showing trails within Burgoyne Bay Provincial Park and connecting to Mount Maxwell Provincial Park), and picnic area at the parking lot may not have any negative impacts on the Park, and would likely confer some benefits: less litter, less off-trail use. These facilities may increase use of the park, while alleviating heavy use of other parks on the island.

The main visitor entrance to the park is heavily modified, including a road, old quarry, parking lot, and boat launch, as well as the beginnings of several trails. This environment is heavily colonized by invasive species, particularly non-native grasses, Himalayan blackberry, and Scotch broom. Restoring this site by removing invasive species and planting indigenous ones, or at least removing the broom and blackberry to prevent their further spread, and considering retaining the grass cover for a day-use picnic area are recommended. If resources permit, the invasive grass cover (annual bluegrass, orchardgrass, etc.) can be removed and re-seeded to native grass species.

The Garry Oak Ecosystem Recovery Team website (www.goert.ca) contains a large list of nurseries that specialize in stocking native seed and plants that use sustainable collection and propagation methods. With limited resources, however, time and funding are best spent restoring sites of high to very high conservation value.

To summarize, management recommendations for conservation of ecosystems and rare species in Burgoyne Bay Provincial Park depend on the proposed degree of management intensity and outcome of management priorities set out for this area. Some of the more salient considerations include:

- Work with Garry Oak Ecosystem Recovery Team and local stakeholders to develop and fulfill management objectives.
- Formalize the trail network to limit traffic and trampling.
- Develop interpretive sign for the main parking lot area showing trails within Burgoyne Bay Provincial Park and connecting to Mount Maxwell Provincial Park.
- Consider a picnic area at the grassy site by the parking lot.
- Install a garbage can and possibly a primitive bathroom facility at the parking lot.
- Keep gates locked.
- Decommission all but one major vehicle access route in the park.
- Consider the relative impacts and benefits of invasive species removal and/or replacement with indigenous species, particularly along ditches, in fields, around parking lot and gravel pit/quarry, and picnic area.
- Monitor abundance and locations of invasive species.
- Permit forested polygons to regenerate and follow successional pathways.

5.3 Mount Maxwell Provincial Park

Many of the habitats of the highest concentrations of rare species and most sensitive ecosystems are protected in the park by limited access (steep terrain). The various trails throughout the park do intersect some of these ecosystems, but visitor use is overwhelmingly between the parking lot and the viewpoint. Given that this area receives a relatively high number of visits, the plant communities are remarkably intact. Keeping feral sheep out of the sensitive Garry oak and herbaceous meadow ecosystems in order to minimize trampling, prevent them from spreading invasive species, and damaging both fragile soils and rare plant species is recommended.

The most apparent issue warranting management inputs for this Park is the interconnection of the trail network between Mount Maxwell and Burgoyne Bay Provincial Parks. As described for Burgoyne Bay Provincial Park, providing a

limited number of developed trails will concentrate visitor impacts and minimize off-trail damage. Current visitor facilities appear to be meeting the needs of users and generally serving the management objectives of the Park.

To summarize relevant management recommendations for Mount Maxwell Provincial Park:

- In conjunction with planning for Burgoyne Bay Provincial Park, formalize the interconnected trail network.
- Wherever feasible, direct trails along the edges of sensitive habitats rather than within them: visitors can still enjoy viewing but minimize disturbance.
- Retain visitor facilities more or less at current levels.
- Permit forested polygons to regenerate and follow successional pathways.

5.4 Mount Maxwell Ecological Reserve

Few trails are present within the Ecological Reserve due to limited access. Many of the habitats of the highest concentrations of rare species and most sensitive ecosystems (Garry oak meadows) are protected in the Ecological Reserve. Preservation of the Ecological Reserve is greatly assisted by the concentration of visitor use at the viewpoint within the adjacent Mt. Maxwell Provincial Park. Plant communities within the Ecological Reserve are remarkably intact. It is important to keep feral sheep out of the sensitive Garry oak and herbaceous meadow ecosystems in order to minimize trampling, prevent them from spreading invasive species, and damaging both fragile soils and rare plant species.

If funding is available, control of and monitoring the abundance of invasive species throughout the Ecological Reserve would be worthwhile. This area provides ideal conditions for restoration due to lack of access and manageable levels of invasives.

To summarize relevant management recommendations for conservation of ecosystems and rare species at Mount Maxwell Ecological Reserve include:

- Prevent access (i.e., do not develop trail networks through the reserve). If unavoidable, direct trails along the edges of sensitive habitats rather than within them: visitors can still enjoy viewing but minimize disturbance.
- Continue to remove feral sheep.
- Monitor abundance and locations of invasive species.
- Develop a program for active removal of invasive species, with focus of effort on restoration of Garry oak ecosystems.

- Work with Garry Oak Ecosystem Recovery Team to develop and fulfill management objectives.
- Permit forested polygons to regenerate and follow successional pathways.

5.5 Ruckle and Beaver Point Provincial Parks and Cusheon Cove Addition

Ruckle and Beaver Point Provincial Parks are primarily a historic preservation and recreational use area, with ecological values only ancillary management objectives. The heavily modified nature of the area has certainly impacted the remaining natural plant communities and habitats. Continuing to provide visitor education and infrastructure is key to supporting the ecological values of these parks. To retain and enhance the ecosystem values and components in the extant plant communities, visitor traffic must be concentrated in the most heavily used areas and discouraged from other areas, especially sites with fluctuating water tables. Interpretive signs and pamphlets are likely necessary to achieve this, in part by emphasizing the importance of remaining on trails and designated use areas, and the negative impacts of off-trail use, especially by bikes. Park patrols by Wardens or maintenance staff are also recommended during the tourist season.

The carpet burweed removal program, as well as other proactive measures to remove invasive species, is important in this park. They serve to educate visitors on these topics, encourage residents and visitors to volunteer and participate in removal programs, as well as to limit encroachment of invasives. Due to the constant flow of visitors, pets, and the agricultural part of the park, invasive species will be an ongoing issue here. Parks may wish to consider replacing the agronomic grass cover in the picnic area with native grasses during the off season.

Invasive herbaceous species and shrubs are relatively abundant along the drainage ditches around the homestead. Ongoing removal and monitoring are recommended; this can be done in conjunction with other weed removal activities at Ruckle Provincial Park.

Vernal pool microhabitats have been identified along the shoreline of the campground area by the picnic tables that contain rare and fragile plant species (e.g., Macoun's meadowfoam). It may be worth considering protection of some of these sites using split rail fencing, and then monitoring their success in comparison to sites with regular use. Split rail fencing is relatively inexpensive and durable, retains a natural aesthetic character and will not impact the delicate hydrology of the pools.

To avoid conflicts with livestock and wildlife, pets in the park should be leashed at all times and only permitted to follow existing trails. As they are presently, farm animals should be kept within paddocks, fields, and the active farm area at all times.

In summary, some recommendations that may help to protect ecological values at Ruckle and Beaver Point Provincial Parks and Cusheon Cove Addition are:

- Keep visitors on trails by widely available interpretive materials.
- Continue and expand invasive species removal and monitoring activities.
- Ensure pets are leashed at all times and kept on trails.
- Park patrols during the tourist season to ensure visitors comply with these measures.
- Maintain farm fences and gates in good repair.
- Do not expand parking areas.
- Explicit protection of vernal pools and relocation of some picnic tables.
- Weigh costs and benefits of replacing the lawn at the campsite/picnic areas with native grasses.

5.6 Mount Erskine Provincial Park

The undeveloped character of Mt. Erskine Provincial Park has both benefits and drawbacks with respect to parks management. A lack of infrastructure retains the natural character of the area, while the same feature also encourages off-trail activities which disturb fragile soils and plants (e.g., mountain biking). Intensive development is not recommended at Mt. Erskine Provincial Park.

To preserve the natural features of the area and limit further negative impacts due to use, minimum-impact ameliorations are recommended. These include:

- Formalizing the trail network based on the existing trails.
- Using natural materials such as downed logs to block off side trails and focus traffic on trails through sensitive areas.
- Installing an interpretive sign at road access points (i.e., an all-weather map showing trails) and explaining the importance of remaining on trails and not disturbing the unique and sensitive vegetation.
- Providing a garbage can at the access points.

5.6.1 Mount Tuam Ecological Reserve and Adjacent Crown Lands Assessment Areas

The designation of Mt. Tuam as an Ecological Reserve precludes any intensive development. Promotion of recreational visits to this site is not recommended due to the abundant friable soils and fragile plant communities on site. This Reserve would provide an ideal location for research on succession and development of these plant communities, the nature and extent of environmental and genetic variability within and among populations, and monitoring of the impacts of climate change on moisture-limiting sites hosting rare plant communities. Disturbance due to brushing along the BC Hydro right-of-way is restricted to a narrow corridor and not a significant negative factor.

The feral sheep observed on site should be considered a threat to the species and ecosystems of Mt. Tuam Ecological Reserve and rare ecosystems of the adjacent Crown Land parcels, both in the short term (impacts due to grazing) and the medium to long term (trampling, increased spread of invasive species and displacement of ephemeral annual and rare indigenous species).

Specific recommendations for Mount Tuam Ecological Reserve include:

- Removing feral sheep in conjunction with area stakeholders.
- Monitoring of invasive species presence and abundance.
- Research on impacts of climate change on the plant assemblages and species on site.
- Do not encourage public access to this site, in order to preserve identified management priorities of the Ecological Reserve.
- Acquire adjacent areas where possible; increasing the size of protected polygons, limiting the potential for fragmentation, and improving ecosystem representation.

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APPENDIX I. CONSERVATION EVALUATION FORM

Step 1. BASELINE INFORMATION								
a) Forested polygon (Y/N)				b) Anthropogenic or sparse (Vegetated or Non-vegetated)				
Yes		No (go to Step 1b)		Vegetated		Non-vegetated		
Age Class	Rank	Ecosystem Unit	Rank	Ecosystem Unit	Rank	Ecosystem Unit	Rank	
6 / 7	1	Wetland	1	Field (Flooded)	3	No Vegetation	6	
5	2	Pond (PD)	1	Field (Non-Flooded)	5	Includes gravel pits (GP), urban (UR), and roads (RZ).		
4	3	Lake (LA)	1	Vineyard (CV)	5			
1 - 3	5	Rock (RO)	1	Orchard (CO)	5			
Garry oak sites--any age	1	Cliff (CL)		Talus slopes (TA)	5			
		Meadow	1	Rural (RW)	5			
BASELINE RANKING =								
Step 2. RED AND BLUE LISTED SPECIES INFORMATION								
Search CDC Species and Ecosystems Explorer and request Element Occurrence data. Use field survey data.								
Presence of listed species		Rank						
Any Red		Automatically becomes a 1						
Blue		Increase Step 1 rank by 1 per if 1-3 species						
Blue		Increase Step 2 rank by 2 per if 4 species or more						
No known listed species		no change						
RED / BLUE RANKING =								
Step 3. POTENTIAL ENDANGERED SPECIES (RED AND BLUE LIST)								
(Applies to Anthropogenic sites, potential to contain endangered species)								
Category		Step 2 rank		Step 3 rank				
Any species red		move up 2 ranks		move step 2 value up 2 ranks				
Any species blue		move up 1 rank		move step 2 value up 1 rank				
No known listed species		no change						
POTENTIAL RANKING =								
Step 4. CONDITION								
(Rate using the highest priority of each category a - e as determinant of rank in equation)								
a) Size (ha)		Rank	b) Fragmented (%)		Rank	c) Shape (edge vs interior)		Rank
> 20		1	0 - 5		1	Round		1
10 - 20		2	5 - 25		2	Intermediate		3
1 - 10		3	25 - 50		4	Linear		5
< 1		6	50 - 100		6			
d) Invasive species (%)		Rank	e) Sensitivity to disturbance		Rank	Total		Rank
0 - 5		1	Dry Sites (v or s modifiers)			a)		
5 - 25		2	Very shallow soil (< 20 cm)		1	b)		
25 - 50		3	Shallow soil (20 - 100cm)		2	c)		
50 - 100		5	Wet Sites			d)		
no data available		n/a	Estuary		1	e)		
			Non-forested wetland		1	Average:		
			Forest marshes		2			
			Fluctuating water table		3			
			None of the above		6			
CONDITION RANKING =								
Step 5. CALCULATION OF ECOLOGICAL PRIORITY RANKING								
a) Using following table, calculate the four above rankings into a standardized value.								
Rank		Value						
1 (Very High)		0.94 - 1.00						
2 (High)		0.83 - 0.93						
3 (Moderate)		0.66 - 0.82						
4 (Low)		0.49 - 0.65						
5 (Very Low)		0.32 - 0.48						
6 (Very Low to Nil)		0.00 - 0.31						
b) Calculate weighted value for each step by multiplying by the weight factor. Sum to calculate the Priority Rank.								
Value (5a)	Weight factor	Weighted value						
Step 1 value	0.50	0.50 * Step 1 value						
Step 2 value	0.20	0.20 * Step 2 value						
Step 3 value	0.10	0.10 * Step 3 value						
Step 4 value	0.20	0.20 * Step 4 value						
Sum:								
PRIORITY RANK=								

APPENDIX II. LIST OF PROVINCIAL RED- AND BLUE-LISTED SPECIES CONFIRMED AND POTENTIALLY OCCURRING IN PARKS AND ECOLOGICAL RESERVES OF SALT SPRING ISLAND (CONSERVATION DATA CENTRE 2007).

Note: potential occurrence and overlapping range in the study area does not necessarily indicate actual presence of these species.

Scientific Name	English Name	Risc Code	Status			
			Global	Provincial	Cosewic	BC Status
Wildlife - Amphibians						
<i>Rana aurora</i>	Red-legged Frog	A-RAAU	G4	S3S4	SC (Nov 2004)	Blue
Wildlife - Reptiles						
<i>Contia tenuis</i>	Sharp-tailed Snake	R-COTE	G5	S1	E (May 1999)	Red
Wildlife – Birds - Waterfowl						
<i>Branta canadensis occidentalis</i>	Canada Goose, <i>occidentalis</i> subspecies	B-CAGO-OC	G5T2T3	S1N		Blue
<i>Phalacrocorax auritus</i>	Double-crested Cormorant	B-DCCO	G5	S3B	NAR (May 1978)	Blue
Wildlife – Birds - Herons						
<i>Ardea herodias fannini</i>	Great Blue Heron, <i>fannini</i> subspecies	B-GBHE-FA	G5T4	S3B,S4N	SC (May 1997)	Blue
<i>Botaurus lentiginosus</i>	American Bittern	B-AMBI	G4	S3B		Blue
<i>Butorides virescens</i>	Green Heron	B-GRHE	G5	S3S4B		Blue
Wildlife – Birds - Raptors						
<i>Accipiter gentilis laingi</i>	Northern Goshawk, <i>laingi</i> subspecies	B-NOGO-LA	G5T2	S2B	T (Nov 2000)	Red
<i>Asio flammeus</i>	Short-eared Owl	B-SEOW	G5	S3B,S2N	SC (May 1994)	Blue
<i>Falco peregrinus anatum</i>	Peregrine Falcon, <i>anatum</i> subspecies	B-PEFA-AN	G4T4	S2B	SC (Apr 2007)	Red
<i>Falco peregrinus pealei</i>	Peregrine Falcon, <i>pealei</i> subspecies	B-PEFA-PE	G4T3	S3B	SC (Apr 2007)	Blue
<i>Glaucidium gnoma swarhi</i>	Northern Pygmy-Owl, <i>swarhi</i> subspecies	B-NPOW-SW	G5T3Q	S3		Blue
<i>Megascops kennicottii kennicottii</i>	Western Screech-Owl, <i>kennicottii</i> subspecies	B-WSOW-KE	G5T4	S3	SC (May 2002)	Blue
<i>Tyto alba</i>	Barn Owl	B-BNOW	G5	S3	SC (Nov 2001)	Blue
Wildlife – Marine Birds						
<i>Phalacrocorax penicillatus</i>	Brandt's Cormorant	B-BRCO	G5	S1B,S4N		Red
<i>Brachyramphus marmoratus</i>	Marbled Murrelet	B-MAMU	G3G4	S2B,S4N	T (Nov 2000)	Red
Wildlife – Birds - Passerines						
<i>Patagioenas fasciata</i>	Band-tailed Pigeon	B-BTPI	G4	S3S4B		Blue
<i>Progne subis</i>	Purple Martin	B-PUMA	G5	S2S3B		Blue
<i>Sialia mexicana pop. 1</i>	Western Bluebird (Georgia Depression population)	B-WEBL	G5TNRQ	SHB		Red
<i>Sturnella neglecta pop. 1</i>	Western Meadowlark (Georgia Depression population)	B-WEME	G5TNRQ	SXB		Red

Wildlife – Birds - Woodpeckers						
<i>Melanerpes lewis pop. 1</i>	Lewis's Woodpecker (Georgia Depression population)	B-LEWO	G5TXQ	SXB		Red
Wildlife - Mammals						
<i>Corynorhinus townsendii</i>	Townsend's Big-eared Bat	M-COTO	G4	S3		Blue
<i>Mustela erminea anguinae</i>	Ermine, <i>anguinae</i> subspecies	M-MUER-AN	G5T3	S3		Blue
<i>Sorex palustris brooksi</i>	American Water Shrew, <i>brooksi</i> subspecies	M-SOPA-BR	G5T2	S2		Red
Wildlife - Invertebrates						
<i>Callophrys mossii mossii</i>	Moss' Elfin, <i>mossii</i> subspecies	IL-CALMOS-MO	G4T4	S2S3		Blue
<i>Coenonympha tullia insulana</i>	Common Ringlet, <i>insulana</i> subspecies	IL-COETUL-IN	G5T3T4	S1		Red
<i>Erynnis propertius</i>	Propertius Duskywing	IL-ERYPRO	G5	S2S3		Blue
<i>Euchloe ausonides insulanus</i>	Large Marble, <i>insulanus</i> subspecies	IL-EUCAUS-IN	G5T1	SX	XT (May 2000)	Red
<i>Euphydryas editha taylora</i>	Edith's Checkerspot, <i>taylora</i> subspecies	IL-EUPEDI-TA	G5T1	S1	E (Nov 2000)	Red
<i>Euphyes vestris</i>	Dun Skipper	IL-EUPVES	G5	S3	T (Nov 2000)	Blue
<i>Fossaria vancouverensis</i>		IM-FOSVAN	GHQ	SH		Red
<i>Hesperia colorado oregonia</i>	Western Branded Skipper, <i>oregonia</i> subspecies		G5T3T4	S2S3		Blue
<i>Physella heterostropha</i>	Pewter Physa	IM-PHYHET	G5Q	S1S3		Red
<i>Physella integra</i>	Ashy Physa	IM-PHYINT	G5	S1S3		Red
<i>Plebejus saepiolus insulanus</i>	Greenish Blue, <i>insulanus</i> subspecies	IL-PLESAE-IN	G5TH	SH	E (Nov 2000)	Red
<i>Promenetus umbilicatellus</i>	Umbilicate Sprite	IM-PROUMB	G4	S3S4		Blue
<i>Sympetrum vicinum</i>	Autumn Meadowhawk	IO-SYMVIC	G5	S3S4		Blue

Wildlife – Gastropods						
<i>Allogona townsendiana</i>	Oregon Forestsnail	IM-ALLTOW	G3G4	S1S2	E (Nov 2002)	Red
<i>Carychium occidentale</i>	Western Thorn	IM-CAROCC	G3G4	S2S3		Blue
<i>Hemphillia dromedarius</i>	Dromedary Jumping-slug	IM-HEMDRO	G3G4	S2	T (May 2003)	Red
<i>Hemphillia glandulosa</i>	Warty Jumping-slug	IM-HEMGLA	G3G4	S2S3	SC (May 2003)	Blue
<i>Monadenia fidelis</i>	Pacific Sideband	IM-MONFID	G4G5	S3S4		Blue
<i>Nearctula sp. 1</i>	Threaded Vertigo	IM-NEASP1	G3G5	S2		Red
<i>Pristiloma johnsoni</i>	Broadwhorl Tightcoil	IM-PRIJOH	G2G3	S2S3		Blue
<i>Prophysaon coeruleum</i>	Blue-grey Taildropper	IM-PROCOE	G3G4	S1	E (Apr 2006)	Red
<i>Prophysaon vanatta</i>	Scarletback Taildropper	IM-PROVAN	G4	S3S4		Blue
<i>Vertigo andrusiana</i>	Pacific Vertigo	IM-VALAND	G2G3	S2		Red
<i>Zonitoides nitidus</i>	Black Gloss	IM-ZONNIT	G5	S3S4		Blue

Plants – Ferns And Allies						
<i>Botrychium simplex</i>	least moonwort	BOTRSIM	G5	S2S3		Blue
<i>Cheilanthes gracillima</i>	lace fern	CHEIGRA	G4G5	S2S3		Blue
<i>Dryopteris arguta</i>	coastal wood fern	DRYOARG	G5	S2S3	SC (Nov 2001)	Blue
<i>Isoetes nuttallii</i>	Nuttall's quillwort	ISOENUT	G4?	S3		Blue
<i>Ophioglossum pusillum</i>	northern adder's-tongue	OPHIPUS	G5	S2S3		Blue
<i>Woodwardia fimbriata</i>	giant chain fern	WOODFIM	G5	S3		Blue
Plants – Dicotyledons						
<i>Abronia latifolia</i>	yellow sand-verbena	ABROLAT	G5	S3		Blue
<i>Anagallis minima</i>	chaffweed	ANAGMIN	G5	S2S3		Blue
<i>Aster curtus</i>	white-top aster	ASTECUR	G3	S2	T (May 2000)	Red
<i>Aster radulinus</i>	rough-leaved aster	ASTERAD	G4G5	S1		Red
<i>Balsamorhiza deltoidea</i>	deltoid balsamroot	BALSDEL	G5	S1	E (May 2000)	Red
<i>Callitriche heterophylla</i> ssp. <i>heterophylla</i>	two-edged water-starwort	CALLHET2	G5T5	S2S3		Blue
<i>Cardamine parviflora</i> var. <i>arenicola</i>	small-flowered bitter-cress	CARDPAR1	G5T5	S1		Red
<i>Castilleja ambigua</i> ssp. <i>ambigua</i>	paintbrush owl-clover	CASTAMB1	G4T3T4	S2		Red
<i>Castilleja levisecta</i>	golden paintbrush	CASTLEV	G1	S1	E (May 2000)	Red
<i>Ceratophyllum echinatum</i>	spring hornwort	CERAECH	G4?	S3		Blue
<i>Chamaesyce serpyllifolia</i> ssp. <i>serpyllifolia</i>	thyme-leaved spurge	CHAMSER1	G5T5	S2S3		Blue
<i>Clarkia amoena</i> var. <i>caurina</i>	farewell-to-spring	CLARAMO1	G5T5?	S3		Blue
<i>Clarkia amoena</i> var. <i>lindleyi</i>	farewell-to-spring	CLARAMO2	G5T5	S3		Blue
<i>Claytonia washingtoniana</i>	Washington springbeauty	CLAYWAS	G2G4	S2		Red
<i>Crassula aquatica</i>	pigmyweed	CRASAQU	G5	S3		Blue
<i>Crassula connata</i> var. <i>connata</i>	erect pygmyweed	CRASCON1	G5TNR	S2		Red
<i>Elatine rubella</i>	three-flowered waterwort	ELATRUB	G5	S2S3		Blue
<i>Epilobium ciliatum</i> ssp. <i>watsonii</i>	purple-leaved willowherb	EPILCIL3	G5T3T5	S2S3		Blue
<i>Epilobium halleanum</i>	Hall's willowherb	EPILHAL	G5	S2S3		Blue
<i>Epilobium torreyi</i>	brook spike-primrose	EPILTOR	G5	SX	E (Apr 2006)	Red
<i>Fraxinus latifolia</i>	Oregon ash	FRAXLAT	G5	S1		Red
<i>Githopsis specularioides</i>	common bluecup	GITHSPE	G5	S2S3		Blue
<i>Helenium autumnale</i> var. <i>grandiflorum</i>	mountain sneezeweed	HELEAUT1	G5T3T5	S2S3		Blue
<i>Heterocodon rariflorum</i>	heterocodon	HETERAR	G5	S3		Blue
<i>Hippuris tetraphylla</i>	four-leaved mare's-tail	HIPPTET	G5	S2S3		Blue
<i>Hutchinsia procumbens</i>	hutchinsia	HUTCPRO	G5	S1		Red
<i>Hydrophyllum tenuipes</i>	Pacific waterleaf	HYDRTEN	G4G5	S2S3		Blue
<i>Hypericum majus</i>	large Canadian St. John's-wort	HYPEMAJ	G5	S2S3		Blue
<i>Idahoia scapigera</i>	scalepod	IDAHSCA	G5	S2		Red
<i>Jaumea carnosa</i>	fleshy jaumea	JAUMCAR	G4G5	S2S3		Blue
<i>Lomatium dissectum</i> var. <i>dissectum</i>	fern-leaved desert-parsley	LOMADIS1	G4T4	S1		Red
<i>Lomatium grayi</i>	Gray's desert-parsley	LOMAGRA	G5	S1		Red
<i>Lotus pinnatus</i>	bog birds-foot trefoil	LOTUPIN	G4G5	S1	E (May 2004)	Red
<i>Lotus unifoliolatus</i> var. <i>unifoliolatus</i>	Spanish-clover	LOTUUNI1	G5T5	S2S3		Blue

<i>Lupinus densiflorus</i> var. <i>densiflorus</i>	dense-flowered lupine	LUPIDEN2	G5T4	S1	E (May 2005)	Red
<i>Lupinus oreganus</i> var. <i>kincaidii</i>	Kincaid's lupine	LUPIORE1	G5T2	SX		Red
<i>Marah oreganus</i>	manroot	MARAORE	G5	S1		Red
<i>Meconella oregana</i>	white meconella	MECOORE	G2G3	S1	E (May 2005)	Red
Plants – Dicotyledons (continued)						
<i>Megalodonta beckii</i> var. <i>beckii</i>	water marigold	MEGABEC1	G4G5T4	S3		Blue
<i>Microseris lindleyi</i>	Lindley's microseris	MICRLIN	G5	S1		Red
<i>Minuartia pusilla</i>	dwarf sandwort	MINUPUS	G5	S1	E (May 2004)	Red
<i>Myriophyllum quitense</i>	waterwort water-milfoil	MYRIQUI	G4?	S2S3		Blue
<i>Myriophyllum ussuriense</i>	Ussurian water-milfoil	MYRIUSS	G3	S3		Blue
<i>Navarretia intertexta</i>	needle-leaved navarretia	NAVAINT	G5	S2		Red
<i>Nothochelone nemorosa</i>	woodland penstemon	NOTHNEM	G5	S2S3		Blue
<i>Orobanche pinorum</i>	pine broomrape	OROBPIN	G4	S1		Red
<i>Orthocarpus bracteosus</i>	rosy owl-clover	ORTHBRA	G3?	S1	E (May 2004)	Red
<i>Plagiobothrys tenellus</i>	slender popcornflower	PLAGTEN	G4G5	S2		Red
<i>Polygonum hydropiperoides</i>	water-pepper	POLYHYR	G5	S2S3		Blue
<i>Psilocarphus elatior</i>	tall woolly-heads	PSILELA	G4Q	S1	E (May 2001)	Red
<i>Psilocarphus tenellus</i> var. <i>tenellus</i>	slender woolly-heads	PSILTEN1	G4T4	S3	NAR (May 1996)	Blue
<i>Ranunculus alismifolius</i> var. <i>alismifolius</i>	water-plantain buttercup	RANUALI1	G5T5	S1	E (May 2000)	Red
<i>Ranunculus californicus</i>	California buttercup	RANUCAL	G5	S1		Red
<i>Ranunculus lobbii</i>	Lobb's water-buttercup	RANULOB	G4	SH		Red
<i>Rubus lasiococcus</i>	dwarf bramble	RUBULAS	G5	S2S3		Blue
<i>Rubus nivalis</i>	snow bramble	RUBUNIV	G4?	S2		Red
<i>Rupertia physodes</i>	California-tea	RUPEPHY	G4	S3		Blue
<i>Sagina decumbens</i> ssp. <i>occidentalis</i>	western pearlwort	SAGIDEC1	G5TNR	S3		Blue
<i>Salix lemmonii</i>	Lemmon's willow	SALILEM	G5	S1		Red
<i>Salix sessilifolia</i>	soft-leaved willow	SALISES	G4	S2S3		Blue
<i>Senecio macounii</i>	Macoun's groundsel	SENEMAC	G5	S3		Blue
<i>Sidalcea hendersonii</i>	Henderson's checker-mallow	SIDAHEN	G3	S3		Blue
<i>Silene scouleri</i> ssp. <i>grandis</i>	Scouler's catchfly	SILESCO1	G5TNR	S1	E (May 2003)	Red
<i>Tonella tenella</i>	small-flowered tonella	TONETEN	G5	S1	E (Nov 2003)	Red
<i>Toxicodendron diversilobum</i>	poison oak	TOXIDIV	G5	S2S3		Blue
<i>Trifolium cyathiferum</i>	cup clover	TRIFCYA	G4	S1		Red
<i>Trifolium depauperatum</i> var. <i>depauperatum</i>	poverty clover	TRIFDEP1	G5T5?	S3		Blue
<i>Trifolium dichotomum</i>	Macrae's clover	TRIFDIC	G4?	S2S3		Blue
<i>Utricularia ochroleuca</i>	ochroleucous bladderwort	UTRIOCH	G4?	S1		Red
<i>Viola howellii</i>	Howell's violet	VIOLHOW	G4	S2S3		Blue
<i>Viola praemorsa</i> ssp. <i>praemorsa</i>	yellow montane violet	VIOLPRA1	G5T3T5	S2	T (May 2000)	Red

Plants – Monocotyledons						
<i>Agrostis pallens</i>	<i>dune bentgrass</i>	AGROPAL	G4G5	S3		Blue
<i>Allium amplexans</i>	<i>slimleaf onion</i>	ALLIAMP	G4	S3		Blue
<i>Allium crenulatum</i>	<i>Olympic onion</i>	ALLICRE	G4	S2		Red
<i>Allium geberi</i> var. <i>tenerum</i>	<i>Geyer's onion</i>	ALLIGEY2	G4G5T3T5	S2S3		Blue
<i>Alopecurus carolinianus</i>	<i>Carolina meadow-foxtail</i>	ALOPCAR	G5	S2		Red
<i>Carex feta</i>	<i>green-sheathed sedge</i>	CAREFET	G5	S2		Red
<i>Carex interrupta</i>	<i>green-fruited sedge</i>	CAREINE	G4	S2		Red
<i>Carex scoparia</i>	<i>pointed broom sedge</i>	CARESCO	G5	S2S3		Blue
<i>Cyperus squarrosus</i>	<i>awned cyperus</i>	CYPESQU	G5	S3		Blue
<i>Eleocharis parvula</i>	<i>small spike-rush</i>	ELEOPAR	G5	S2S3		Blue
<i>Eleocharis rostellata</i>	<i>beaked spike-rush</i>	ELEOROS	G5	S2S3		Blue
<i>Glyceria leptostachya</i>	<i>slender-spiked mannagrass</i>	GLYCLEP	G3	S2S3		Blue
<i>Juncus kelloggii</i>	<i>Kellogg's rush</i>	JUNCKEL	G3?	S1	E (May 2003)	Red
<i>Juncus oxymers</i>	<i>pointed rush</i>	JUNCOXY	G5	S2S3		Blue
<i>Leymus triticoides</i>	<i>creeping wildrye</i>	LEYMTRI	G4G5	S1		Red
<i>Lilaea scilloides</i>	<i>flowering quillwort</i>	LILASCI	G5?	S2S3		Blue
<i>Malaxis brachypoda</i>	<i>white adder's-mouth orchid</i>	MALABRA	G4Q	S2S3		Blue
<i>Melica smithii</i>	<i>Smith's melic</i>	MELISMI	G4	S2S3		Blue
<i>Piperia candida</i>	<i>white-lip rein orchid</i>	PIPECAN	G3G4	S2		Red
<i>Piperia elegans</i>	<i>elegant rein orchid</i>	PIPEELE	G4	S3		Blue
<i>Pleuropogon refractus</i>	<i>nodding semaphoregrass</i>	PLEUREF	G4	S3		Blue
<i>Potamogeton oakesianus</i>	<i>Oakes' pondweed</i>	POTAOAK	G4	S2S3		Blue
<i>Schoenoplectus americanus</i>	<i>Olney's bulrush</i>	SCHOAME	G5	S1		Red
<i>Triglochin concinna</i>	<i>graceful arrow-grass</i>	TRIGCON	G5	S2		Red
<i>Triteleia howellii</i>	<i>Howell's triteleia</i>	TRITHOW	G3G4	S1	E (May 2003)	Red
<i>Wolffia columbiana</i>	<i>Columbian water-meal</i>	WOLFCOL	G5	S1		Red

- Notes**
1. Citation: B.C. Conservation Data Centre. 2007. BC Species and Ecosystems Explorer. B.C. Minist. of Environ. Victoria, BC. Available: <http://srmapps.gov.bc.ca/apps/eswp/> (accessed [enter date accessed]).
 2. Forest District tracking lists are restricted to those species that breed in the District; i.e. species will not be placed on Forest District lists for Districts where they occur only as migrants.



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FEATURE.ID	LOCATION	DIRECTIONS	EODATA	ECOSECTION	BGC	EORANK	LASTOBS	EOREFCODES
* INVERTEBRATE ANIMAL								
*** Callophrys mossii mossii (Moss' Elfin, <i>mossii</i> subspecies) :G4T4 -S2S3 -Blue								
28139	SALT SPRING ISLAND, SOUTH EAST	151 Andrew Place; off the end of the side road off Demitri Way off Beaver Point Road (Salt Spring Island) (van Patten 2005).	2004: 1-2 seen over two days within the same garden (van Patten 2005). Cultivated garden and orchard within a clearing surrounded by woodland, rocky outcrops, Douglas-fir and arbutus; alder and cedar in low lying places each with their associated shrubs, plants and herbaceous species.	SGI	CDF mm	BC	2004-04-23	U05VAN01BCCA
*** Callophrys mossii mossii (Moss' Elfin, <i>mossii</i> subspecies) :G4T4 -S2S3 -Blue								
9516	SALTSPRING ISLAND, BAYNES PEAK	In parking lot area and trail along rim of precipitous cliff at summit of Mount Maxwell Provincial Park.	Records from 1995 and 2004 of 7 and 4 respectively from around the parking lot area and along the cliff trail of Mount Maxwell Provincial Park (Shepard 1995 and van Patten 2005). Steep rock cliff with minimum vegetation. There were patches of <i>Sedum spathulifolium</i> .	SGI	CWH xm 1	E	2004-04-25	U05VAN01BCCA; U95SHE03BCCA
*** Erynnis propertius (Propertius Duskywing) :G5 -S2S3 -Blue								
9090	SALTSPRING ISLAND, LAKE MAXWELL	North edge of ecological reserve (Shepard 1995). Moutn MAXweel Park and Ecological Reserve, including parking lot area and trail along rim of precipitous cliffs within park.	1953: Specimen; exact location on Mount Maxwell unknown. 1995: 2 males in Garry oak mixed with Douglas-fir, some camas (Shepard 1995). 2004: Five puddling, basking and flying at the top of the hill around the parking lot area and along cliff trail (van Patten 2005). Garry oaks mixed with Douglas-fir and cliffs.	SGI	CWH xm 1	AC	2005-05-26	U05VAN01BCCA; U95SHE03BCCA
*** Erynnis propertius (Propertius Duskywing) :G5 -S2S3 -Blue								
9192	SALTSPRING ISLAND, MOUNT TUAM		1995: 13 males and 2 females in an oak stand, understory heavily grazed by sheep except one draw with camas and vetch where the sheep had not grazed. Dry, rocky slope with oak stand	SGI	CWH xm 1		1995-05-06	U95SHE03BCCA
*** Euphyes vestris (Dun Skipper) :G5 -S3 -Blue								



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FEATURE.ID	LOCATION	DIRECTIONS	EODATA	ECOSECTION	BGC	EO RANK	LASTOBS	EOREFCODES
* INVERTEBRATE ANIMAL								
28136	SALT SPRING ISLAND; SOUTH EAST	End of Andrew Place (#s 144 and 151), a side road off Demitri Way off Beaver Point Road on the south side of Salt Spring Island.	2003 and 2004: Seen each year on either side of the road, basking in the long grass and nectaring on blue sage (van Patten 2005). For at least one portion of the occurrence it is a cultivated garden and orchard within a clearing surrounded by woodland, rocky outcrops, Douglas-fir and arbutus; alder and cedar in low lying places each with their associated shrubs, plants and herbaceous species. It is likely that the other portion is similar.	SGI	CDF mm	BC	2004-06-22	U05VAN01BCCA
*** Speyeria zerene bremnerii (Zerene Fritillary, <i>bremnerii</i> subspecies) :G5T3T4 -S2 -Red								
11704	SALTSPRING ISLAND, MOUNT TUAM	North slope.	1995: the main population (140+ males and 5 females) was found just south of the summit on an open grassy slope with a few mature Douglas-fir. Grass grazed by domestic and feral sheep. Males just emerging. Also found in three spots with 3 or 4 males in each along the north slope of Mount Tuam, along the road in thistles and second growth forest (Shepard 1995). Also 10 males seen nectaring on thistles. 1994: 4 at summit (S. Ansell, pers. comm.).	SGI	CWH xm 1		1995-07-18	O91PMV01BCCA; P95ANS01BCCA; U95SHE03BCCA
* NONVASCULAR PLANT								
*** Entosthodon fascicularis (banded cord-moss) :G4G5 -S2S3 -Blue								
29432	SALTSPRING ISLAND, ISABELLA POINT		One small patch over 1 cm by 2 cm on soil in grotto under rock (T. McIntosh, pers. comm. 2006). Garry oak woodland.	SGI	CDF mm	C?	2005-04-10	P05MC101BCCA; U05COS03BCCA
* TERRESTRIAL COMMUNITY - OTHER CLASSIFICATION								
*** Pseudotsuga menziesii - Arbutus menziesii (Douglas-fir - arbutus) :GNR -S2 -Red								



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FEATURE.ID	LOCATION	DIRECTIONS	EODATA	ECOSECTION	BGC	EORANK	LASTOBS	EOREFCODES
* TERRESTRIAL COMMUNITY - OTHER CLASSIFICATION								
9064	SALTSPRING ISLAND, MOUNT MAXWELL	Southwest ridge Baynes Peak, Saltspring Island.	E.R. CDF Table - Cell #6. This community is found on the strongly sloping southwest side of Baynes Peak, facing Sansun Narrows. Site is very dry with rock outcrops, shallow soils over bedrock with some deeper pockets, occurs in mosaic with Garry oak community types.	SGI;SOG	CDF mm;CWH xm 1	CD	1979-PRE	G89PAR01BCCA; U91ERP01BCCA
*** Pseudotsuga menziesii - Arbutus menziesii (Douglas-fir - arbutus) :GNR -S2 -Red								
6870	SALTSPRING ISLAND, MOUNT TUAM	4 km south of Fulford Harbour, Saltspring Island.	CDF E.R. Table, Cell #6,7,8."The community occurs on the steep rugged, southeast slope of Mount Tuam facing Satellite Channel ... slopes consist of a series of rounded knolls separated by draws. The community occurs with Douglas fir-salal and cedar-sword fern community types.	SGI;SOG	CDF mm;CWH xm 1	B	1979-PRE	G89PAR01BCCA; U91ERP01BCCA
*** Pseudotsuga menziesii / Mahonia nervosa (Douglas-fir / dull Oregon-grape) :G2 -S2 -Red								
6878	SALTSPRING ISLAND, MOUNT TUAM	4 km south of Fulford Harbour, Saltspring Island.	E.R. CDF Table Cell #11."This community occurs on the steep rugged, southeast slope of Mount Tuam facing Satellite Channel... slopes consist of a series of rounded knolls separated by draws. The community occurs with Douglas-fir/Arbutus and Cedar/sword fern community types."	SGI;SOG	CDF mm;CWH xm 1	B	1979-PRE	G89PAR01BCCA; U91ERP01BCCA
*** Quercus garryana / Bromus carinatus (Garry oak / California brome) :GNR -S1 -Red								
9078	SALTSPRING ISLAND, MOUNT MAXWELL	Southwest side of Baynes Peak, Saltspring Island, B.C.	E.R. CDF Table - Cell #1. This community is found on the strongly sloping southwest side of Baynes Peak facing Sansun Narrows. Site is very dry with rock outcrops, shallow soils over bedrock with some deeper pockets. Occurs in mosaic of Garry oak, ocean spray and mixed Douglas fir-Arbutus stands.	SGI;SOG	CDF mm;CWH xm 1	BC	1979-PRE	G89PAR01BCCA; U91ERP01BCCA
*** Quercus garryana / Holodiscus discolor (Garry oak / oceanspray) :GNR -S1 -Red								



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FEATURE.ID	LOCATION	DIRECTIONS	EODATA	ECOSECTION	BGC	FORANK	LASTOBS	EOREFCODES
* TERRESTRIAL COMMUNITY - OTHER CLASSIFICATION								
9084	SALTSPRING ISLAND, MOUNT MAXWELL	Southwest side of Baynes Peak, Saltspring Island.	E.R. CDF Table - Cell #2, 3. This community is found on the strongly sloping southwest side of Baynes Peak, facing Sansum Narrows. Site is very dry with rock outcrops, shallow soils over bedrock with some deeper pockets. Occurs in mosaic with Garry oak-broom and mixed Douglas fir-Arbutus stands.	SGI;SOG	CDF mm;CWH xm 1	BC	1979-PRE	G89PAR01BCCA; U91ERP01BCCA
*** Thuja plicata / Achlys triphylla (western redcedar / vanilla leaf) :GNR -S1 -Red								
6884	SALTSPRING ISLAND, MOUNT TUAM	4 km south of Fulford Harbour, Saltspring Island.	CDF E.R. Table, Cell #15. This community occurs on the steep rugged, southeast slope of Mt. Tuam facing Satellite Channel. Slopes consist of a series of rounded knolls separated by draws. This community occurs in the draws with the Douglas-fir-Salal and Douglas-fir-Arbutus occurring on drier sites.	SGI;SOG	CDF mm;CWH xm 1	B	1979-PRE	G89PAR01BCCA; U91ERP01BCCA
* VASCULAR PLANT								
*** Allium amplexans (slimleaf onion) :G4 -S3 -Blue								
14639	SALTSPRING ISLAND, BAYNES PEAK		S-facing bluffs and ledges.	SGI;SOG	CDF mm;CWH xm 1		1981-08-29	O92PMV01BCCA
*** Carex feta (green-sheathed sedge) :G5 -S2 -Red								
3328	SALTSPRING ISLAND, BEAVER POINT		1960: Collected (Ashley). 1957: Collected (Ashley). Wet pocket in cliffs.	SGI;SOG	CDF mm	E	1960-07	O91DAO01BCCA
*** Idahoa scapigera (scalepod) :G5 -S2 -Red								
9116	SALTSPRING ISLAND, BAYNES PEAK		Mossy and wet outcrops, SW-facing rock.	SGI;SOG	CDF mm;CWH xm 1		1980-04-03	O92PMV01BCCA
*** Idahoa scapigera (scalepod) :G5 -S2 -Red								



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FEATURE.ID	LOCATION	DIRECTIONS	EODATA	ECOSECTION	BGC	EORANK	LASTOBS	EOREFCODES
* VASCULAR PLANT								
9222	SALTSPRING ISLAND, MOUNT TUAM	Site is within 250 m of UTM.	1996: On seepy south-facing bank of grassy, 10 degree slope. 200 plants, with <i>Mimulus guttatus</i> , <i>Sparganium natans</i> , <i>Hypochaeris radicata</i> , <i>Trifolium variegatum</i> , <i>Sedum integrifolium</i> ssp. <i>integrifolium</i> . 1980: South-facing, mossy outcrops.	SGI;SOG	CDF mm;CWH xm 1	A	1996-05-16	O92PMV01BCCA; P91JAN02BCCA; P95PEN01BCCA
*** <i>Limnanthes macounii</i> (Macoun's meadow-foam) :G2 -S2 -Red								



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FEATURE.ID	LOCATION	DIRECTIONS	EODATA	ECOSECTION	BGC	EO RANK	LASTOBS	EOREFCODES
* VASCULAR PLANT								
7808	BEAVER POINT, SALTSPRING ISLAND	Five subpopulations are located in seepage sites, pools and ditches near the shoreline at the Ruckle Provincial Park campsite.	Five sub-populations of <i>Limnanthes macounii</i> have been observed at Beaver Point between 1978 and 2002. All are located in seepage sites, pools or ditches, and all were extant in the spring of 2002. Three are large in size (>200 plants), one is medium (51 to 200 plants) and one is small (<50 plants). The first observation was in 1978, a medium population in a seepage site near the shoreline. This population was observed again in 1994 and 2002, and remained stable in size. During a 2002 survey, a small population was observed in a second seepage site less than 10 metres away; the two sites are regarded as a single sub-population (28.2). In 1994, three new sub-populations were located: a large population in a pool next to a pump (28.4); a small population in a ditch next to a fence (28.5), and another large population in a seepage site upslope from the small population (28.6). All three were re-located in 2002 and had remained stable in size. A fifth large population was located in 2002, in a ditch close to a road (Ceska 1988; Ceska 2003; COSEWIC 2004; Ceska, pers. comm. 2006). The invasive <i>Soliva sessilis</i> occurs at this site, and control measures have been undertaken. Sloping rocky shoreline on the southeast coast of Saltspring Island. The area is a public campsite within a provincial park.	SGI;SOG	CDF mm	B	2002-SP	N03CES01BCCA; O92PMV01BCCA; P91CES01BCCA; U04COS12BCCA; U88CES01BCCA

*** *Lomatium grayi* (Gray's desert-parsley) :G5 -S1 -Red



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FEATURE.ID	LOCATION	DIRECTIONS	EODATA	ECOSECTION	BGC	EURANK	LASTOBS	EOREFCODES
* VASCULAR PLANT								
9106	SALTSPRING ISLAND, BAYNES PEAK	As of June 2002, there are 9 known populations of <i>Lomatium grayi</i> in Mount Maxwell Provincial Park. They occur on southwest facing rock walls, ranging northwest and southeast from below the summit viewpoint.	2002-05-27 to 2002-06-05: Ca. 200 individuals over an area of 25 to 30 hectares, in 8 subpopulations ca. 50 to 300 metres apart. One known sub-population closest to northwest boundary of park not re-located. 1996-02-25: Two patches of a few plants each (Ceska). 1996-05-15: Two populations located: 15 plants and 40 respectively (Penny). 1982-06-20: Collected (Ceska). 1981-08-29: Collected (Janszen). 1980-05-25: Collected (Janszen). 2002: On inaccessible cliffs, either on ledges with soil or in sheer rock crevices; a minority of the populations in microhabitats with slight seepage. Associates do not form a consistent plant community. <i>Sedum spathulifolium</i> occurs at 75% of the sites, <i>Cerastium arvense</i> at 50% of sites. 1996-05-15: Two populations examined. One on an almost vertical southwest-facing rock face, with <i>Bromus tectorum</i> , <i>Poa secunda</i> , <i>Erodium cicutaria</i> , <i>Rosa sp.</i> , <i>Galium aparine</i> , <i>Cerastium arvense</i> . The second on a small rocky cliff on a grassy <i>Pseudotsuga-Quercus</i> dominated slope; aspect north, slope 60 degrees. With <i>Bromus sitchensis</i> , <i>Selaginella wallacei</i> , <i>Lotus nevadensis</i> , <i>Sedum spathulifolium</i> and <i>Claytonia perfoliata</i> . 1996-02-25: On <i>Pseudotsuga-Arbutus</i> dominated slope under a rock overhang. 1981-08-29: South-facing bluffs and ledges.	SGI	CWH xm 1	B	2002-06-05	O92PMV01BCCA; P91CES01BCCA; P91JAN02BCCA; P95PEN01BCCA; U02JAN01BCCA



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FEATURE.ID	LOCATION	DIRECTIONS	EODATA	ECOSECTION	BGC	EO RANK	LASTOBS	EOREFCODES
* VASCULAR PLANT								
*** Viola praemorsa ssp. praemorsa (yellow montane violet) :G5T3T5 -S2 -Red								
9150	SALTSPRING ISLAND, MOUNT MAXWELL		In <i>Quercus garryana</i> stand, grazed. Just outside proposed extension to Ecological Reserve.	SGI;SOG	CDF mm;CWH xm 1		1985	P91ROE01BCCA
*** Viola praemorsa ssp. praemorsa (yellow montane violet) :G5T3T5 -S2 -Red								
9226	SALTSPRING ISLAND, MOUNT TUAM	Just below air beacon at summit.	1996: Two hundred plants scattered over 50 x 50 metre area. On grassy slope dotted with rocks. Grazed. 30 degree south exposure with <i>Rumex acetosella</i> , <i>A. serpyllifolia</i> , <i>C. ciliata</i> , <i>Bromus tectorum</i> , <i>Urtica dioica</i> . 1993: Meadow dominated by <i>Cerastium arvense</i> , <i>Anthoxanthum odoratum</i> and <i>Zygadenus elegans</i> .	SGI	CWH xm 1	B	1996-05-16	O92PMV01BCCA; P91CHA02BCCA; P95PEN01BCCA
*** Yabea microcarpa (California hedge-parsley) :G5? -S2 -Red								
27875	SALTSPRING ISLAND, ERSKINE POINT		Two patches of 40 seedlings on open rock outcrops on the margin of Garry oak stands. With <i>Perideridia gairdneri</i> and <i>Taraxacum officinale</i> , in young Douglas-fir forest with logged stumps and dominant <i>Arbutus menziesii</i> . Douglas-fir and Garry oak forests and meadows on steep slopes above ocean.	SGI	CDF mm	C	2005-04-08	P91CES01BCCA
*** Yabea microcarpa (California hedge-parsley) :G5? -S2 -Red								
27711	SALTSPRING ISLAND, MAXWELL POINT		35 fruiting plants, in two sub-populations, over 5 square metres on steep west-facing colluvial slopes in dry, shallow (0 - 50 cm) scree-type soil, under partial shade. In <i>Pseudotsuga menziesii</i> - <i>Quercus garryana</i> forest with <i>Alium acuminatum</i> , <i>Elymus glaucus</i> , <i>Bromus sterilis</i> and <i>Cynosurus echinatus</i> . West-facing coastal Douglas fir - Garry oak woodland.	SGI	CDF mm	BC	2004-06-03	P91ROE01BCCA
*** Yabea microcarpa (California hedge-parsley) :G5? -S2 -Red								



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FEATURE.ID	LOCATION	DIRECTIONS	EODATA	ECOSECTION	BGC	EORANK	LASTOBS	EOREFCODES
* VASCULAR PLANT								
10116	SALTSPRING ISLAND, MOUNT MAXWELL ECOLOGICAL RESERVE		<p>2004-05-17: From 1000 to 1500 plants over 0.6 square km. In rock rubble, woody debris, on mossy rock and along a mossy runnel within a <i>Quercus garryana</i> woodland on a south to southwest facing slope. Surrounding vegetation varies from sparse to heavy and includes <i>Bromus sterilis</i>, <i>Cynosurus echinatus</i>, <i>Galium aparine</i>, <i>Geranium molle</i>, <i>Lotus micranthus</i> and <i>Vicia hirsuta</i> (Douglas, 2004; Douglas and Smith, 2004).</p> <p>1996-05-15: 100 plants, not flowering, on a grassy fir and oak slope with a southeast exposure, with <i>Holcus lanatus</i>, <i>Galium aparine</i>, <i>Montia perfoliata</i>, <i>Sanicula crassicaulis</i>, and <i>Osmorhiza chilensis</i>. A second population of 50 plants was observed on a mossy fir/oak bluff with a northwest exposure, with <i>Cynosurus echinatus</i>, <i>Athysanus pusillus</i>, <i>Poa secunda</i>, <i>Anthoxanthum odoratum</i>, <i>Polytrichum juniperinum</i>, and <i>Mimulus alsinoides</i> (Janszen et al. 1996).</p> <p>1982-05-19: Mossy rock outcrop and oak-fir forest, south slope (Royal British Columbia herbarium). Steep, south-facing colluvial slopes of open Douglas-fir/Garry Oak woodland.</p>	SGI		B	2004-05-17	E04DOU01BCCA; F96JAN01BCCA; G04DOU05BCCA

*** *Yabea microcarpa* (California hedge-parsley) :G5? -S2 -Red



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FEATURE.ID	LOCATION	DIRECTIONS	EODATA	ECOSECTION	BGC	EORANK	LASTOBS	EOREFCODES
* VASCULAR PLANT								
32058	SALTSPRING ISLAND, MOUNT MAXWELL PROVINCIAL PARK		This occurrence consists of two sites, ca. 175 m apart. On very steep south-facing slope, on colluvial material near base of conglomerate cliffs. Open forest of Douglas-fir, <i>Acer macrophyllum</i> and <i>Quercus garryana</i> . With <i>Osmorhiza</i> , <i>Trientalis</i> , <i>Festuca occidentalis</i> , <i>Galium aparine</i> , <i>Melica harfordii</i> , <i>Lactuca muralis</i> , <i>Bromus vulgaris</i> , <i>Collinsia parviflora</i> , <i>Nemophila parviflora</i> and <i>Montia perfoliata</i> (H. Roemer, pers. comm.). Steep, south-facing colluvial slopes of open Douglas-fir/Garry Oak woodland.		CWH xm 1	E	2002-06-05	P91ROE01BCCA
* VERTEBRATE ANIMAL								
*** <i>Megascops kennicottii kennicottii</i> (Western Screech-Owl, <i>kennicottii</i> subspecies) :G5T4 -S3 -Blue								
16146	SALTSPRING ISLAND, BEAVER POINT		1992: 2 downy young come into a whistled call. Two adults have been heard calling in the area every year since 1987 in July and August (D. Fraser, pers. comm.; L. Ramsay, pers. comm.).	SGI;SOG	CDF mm		1992-07	P91FRA03BCCA; P92RAM01BCCA
*** <i>Megascops kennicottii kennicottii</i> (Western Screech-Owl, <i>kennicottii</i> subspecies) :G5T4 -S3 -Blue								
16434	SALTSPRING ISLAND, BEAVER POINT, 1.1 KM EAST OF		Two birds heard in this spot every year in June, July and/or August (D. Fraser, pers. comm.).	SGI	CDF mm		1993-06	P91FRA03BCCA
*** <i>Tyto alba</i> (Barn Owl) :G5 -S3 -Blue								
1160	SALTSPRING ISLAND, BULLMAN ROAD	170 - Bullman Road.	1989, 1990, 1991: a brood was fledged from this site each of these years. Nest is in a natural cavity in a snag. Two young have been seen each year (D. Fraser, pers. comm.; British Columbia Nest Records Scheme 1991).	SGI	CDF mm		1991	O91NRS01BCCA; P91FRA03BCCA

28 Records Processed

APPENDIX III. LIST OF PROVINCIAL RED- AND BLUE-LISTED PLANT COMMUNITIES POTENTIALLY OCCURRING ON SALT SPRING ISLAND.

Potential Rare Plant Communities Found in the CDFmm.

Note: potential occurrence and overlapping range in the study area does not necessarily indicate actual presence of these ecosystems.

Scientific Name	English Name	Status			BGC
		Global	Provincial	BC Status	
<i>Abies grandis</i> / <i>Mahonia nervosa</i>	grand fir / dull Oregon-grape	GNR	S1	Red	CDFmm/04
<i>Abies grandis</i> / <i>Tiarella trifoliata</i>	grand fir / three-leaved foamflower	GNR	S1	Red	CDFmm/06
<i>Alnus rubra</i> / <i>Carex obnupta</i> [<i>Populus balsamifera</i> ssp. <i>trichocarpa</i>]	red alder / slough sedge [black cottonwood]	GNR	S1	Red	CDFmm/14
<i>Alnus rubra</i> / <i>Lysichiton americanus</i>	red alder / skunk cabbage	GNR	S2S3	Blue	CDFmm/11
<i>Arbutus menziesii</i> / <i>Arctostaphylos columbiana</i>	arbutus / hairy manzanita	GNR	S2	Red	CDFmm/00 CWHxm1/00
<i>Artemisia campestris</i> / <i>Grindelia integrifolia</i>	northern wormwood / Puget Sound gumweed	GNR	S1	Red	CDFmm/00
<i>Carex lasiocarpa</i> - <i>Rhynchospora alba</i>	slender sedge - white beak-rush	GNR	S2	Red	CDFmm/Wf53 CWHmm1/Wf53 CWHmm2/Wf53 CWHxm1/Wf53 CWHxm2/Wf53
<i>Carex lyngbyei</i> Herbaceous Vegetation	Lyngbye's sedge herbaceous vegetation	GNR	S3	Blue	CDFmm/Em05
<i>Carex macrocephala</i> Herbaceous Vegetation	large-headed sedge Herbaceous Vegetation	GNR	S1S2	Red	CDFmm/00 CWHvh1/00
<i>Deschampsia cespitosa</i> ssp. <i>beringensis</i> - <i>Aster subspicatus</i>	tufted hairgrass - Douglas' aster	GNR	S3	Blue	CDFmm/Ed02 CWH/Ed02
<i>Deschampsia cespitosa</i> ssp. <i>beringensis</i> - <i>Hordeum brachyantherum</i>	tufted hairgrass - meadow barley	GNR	S3	Blue	CDFmm/Ed01
<i>Distichlis spicata</i> var. <i>spicata</i> Herbaceous Vegetation	seashore saltgrass Herbaceous Vegetation	GNR	S1S2	Red	CDFmm/Em03
<i>Dulichium arundinaceum</i> Herbaceous Vegetation	three-way sedge	GNR	S2	Red	CDFmm/Wm51 CWHmm1/Wm51 CWHxm2/Wm51 ICHwk1/Wm51
<i>Eleocharis palustris</i> Herbaceous Vegetation	common spike-rush	GNR	S3	Blue	BGxw2/Wm04 CDFmm/Wm04 ESSFdv d/Wm04 ESSFdv/Wm04 IDFxm/Wm04 SBSdk/Wm04 SBSmk2/Wm04
<i>Festuca idahoensis</i> ssp. <i>roemerii</i> - <i>Koeleria macrantha</i>	Roemer's fescue - junegrass	GNR	S1	Red	CDFmm/00 CWHxm1/00
<i>Juncus arcticus</i> - <i>Plantago macrocarpa</i>	arctic rush - Alaska plantain	GNR	S1	Red	CDFmm/Ed03 CWH/Ed03
<i>Menyanthes trifoliata</i> - <i>Carex lasiocarpa</i>	buckbean - slender sedge	GNR	S3	Blue	CDFmm/Wf06 CWHws1/Wf06 ICHwk1/Wf06 IDFdk2/Wf06 SBSdk/Wf06
<i>Myosurus minimus</i> - <i>Montia</i> spp. - <i>Limnanthes macounii</i>	tiny mousetail - montias - Macoun's meadow-foam	GNR	S1	Red	CDFmm/00
<i>Myrica gale</i> / <i>Carex sitchensis</i>	sweet gale / Sitka sedge	GNR	S2	Red	CDFmm/Wf52

Scientific Name	English Name	STATUS			BGC
		Global	Provincial	BC Status	
<i>Pinus contorta</i> / <i>Sphagnum</i> spp. CDFm	lodgepole pine / peat-mosses CDFm	GNR	S1	Red	CDFm/10
<i>Populus tremuloides</i> / <i>Malus fusca</i> / <i>Carex obnupta</i>	trembling aspen / Pacific crab apple / slough sedge	GNR	S1S2	Red	CDFm/00
<i>Pseudotsuga menziesii</i> - <i>Arbutus menziesii</i>	Douglas-fir - arbutus	GNR	S2	Red	CDFm/02
<i>Pseudotsuga menziesii</i> / <i>Mahonia nervosa</i>	Douglas-fir / dull Oregon-grape	GNR	S2	Red	CDFm/01
<i>Pseudotsuga menziesii</i> / <i>Melica subulata</i>	Douglas-fir / Alaska oniongrass	GNR	S1	Red	CDFm/03
<i>Quercus garryana</i> - <i>Arbutus menziesii</i>	Garry oak - arbutus	GNR	S1	Red	CDFm/00
<i>Quercus garryana</i> / <i>Bromus carinatus</i>	Garry oak / California brome	GNR	S1	Red	CDFm/00
<i>Quercus garryana</i> / <i>Holodiscus discolor</i>	Garry oak / oceanspray	GNR	S1	Red	CDFm/00
<i>Ruppia maritima</i> Herbaceous Vegetation	beaked ditch-grass Herbaceous Vegetation	GNR	S2	Red	CDFm/Em01 CWH/Em01
<i>Salicornia virginiana</i> - <i>Glaux maritima</i>	American glasswort - sea-milkwort	GNR	S2	Red	CDFm/Em02 CWH/Em02
<i>Salix sitchensis</i> - <i>Salix lucida</i> ssp. <i>lasiandra</i> / <i>Lysichiton americanus</i>	Sitka willow - Pacific willow / skunk cabbage	GNR	S2	Red	CDFm/Ws51 CWH/Ws51 ICH/Ws51
<i>Thuja plicata</i> - <i>Pseudotsuga menziesii</i> / <i>Eurhynchium oreganum</i>	western redcedar - Douglas-fir / Oregon beaked-moss	GNR	S1	Red	CDFm/05
<i>Thuja plicata</i> / <i>Achlys triphylla</i>	western redcedar / vanilla leaf	GNR	S1	Red	CDFm/12
<i>Thuja plicata</i> / <i>Oemleria cerasiformis</i>	western redcedar / Indian-plum	GNR	S1	Red	CDFm/13
<i>Thuja plicata</i> / <i>Symphoricarpos albus</i>	western redcedar / common snowberry	GNR	S1	Red	CDFm/07
<i>Typha latifolia</i> Marsh	common cattail Marsh	GNR	S3	Blue	BGxh1/Wm05 BGxh2/Wm05 BGxw1/Wm05 CDFm/Wm05 CWHdm/Wm05 CWHxm1/Wm05 CWHxm2/Wm05 IDFdk3/Wm05 IDFdm2/Wm05 PPxh1/Wm05

Potential Rare Plant Communities Found in the CWHxm1.

Status

Scientific Name	English Name	Global	Provincial	BC Status	BGC
<i>Arbutus menziesii</i> / <i>Arctostaphylos columbiana</i>	arbutus / hairy manzanita	GNR	S2	Red	CDFmm/00 CWHxm1/00
<i>Carex lasiocarpa</i> - <i>Rhynchospora alba</i>	slender sedge - white beak-rush	GNR	S2	Red	CDFmm/Wf53 CWHmm1/Wf53 CWHmm2/Wf53 CWHxm1/Wf53 CWHxm2/Wf53
<i>Carex sitchensis</i> - <i>Oenanthe</i> <i>sarmentosa</i>	Sitka sedge - Pacific water-parsley	GNR	S3	Blue	CWHvh2/Wm50 CWHwm/Wm50 CWHxm1/Wm50
<i>Deschampsia cespitosa</i> - <i>Sidalcea hendersonii</i>	tufted hairgrass - Henderson's checker- mallow	GNR	S1S2	Red	CWHxm1/00
<i>Festuca idahoensis</i> ssp. <i>roemerii</i> - <i>Koeleria macrantha</i>	Roemer's fescue - junegrass	GNR	S1	Red	CDFmm/00 CWHxm1/00
<i>Ledum groenlandicum</i> / <i>Kalmia</i> <i>microphylla</i> / <i>Sphagnum</i> spp.	Labrador tea / western bog-laurel / peat-mosses	GNR	S3	Blue	CWHvm1/Wb50 CWHxm1/Wb50 CWHxm2/Wb50
<i>Myrica gale</i> / <i>Carex sitchensis</i>	sweet gale / Sitka sedge	GNR	S2	Red	CDFmm/Wf52 CWHmm1/Wf52 CWHmm2/Wf52 CWHvh2/Wf52 CWHwm/Wf52 CWHxm1/Wf52 CWHxm2/Wf52
<i>Picea sitchensis</i> / <i>Rubus</i> <i>spectabilis</i> Very Dry Maritime	Sitka spruce / salmonberry Very Dry Maritime	GNR	S2	Red	CWHxm1/08 CWHxm2/08
<i>Pinus contorta</i> / <i>Sphagnum</i> spp. Very Dry Maritime	lodgepole pine / peat- mosses Very Dry Maritime	GNR	S3	Blue	CWHxm1/11 CWHxm2/11
<i>Pinus contorta</i> var. <i>contorta</i> / <i>Juniperus communis</i> - <i>Arctostaphylos columbiana</i>	shore pine / common juniper - hairy manzanita	GNR	S1	Red	CWHxm1/00
<i>Populus balsamifera</i> ssp. <i>trichocarpa</i> - <i>Alnus rubra</i> / <i>Rubus spectabilis</i>	black cottonwood - red alder / salmonberry	GNR	S3	Blue	CWHdm/09 CWHds1/09 CWHds2/09 CWHmm1/09 CWHms1/08 CWHms2/08 CWHvm1/10 CWHwm/06 CWHws1/08 CWHws2/08 CWHxm1/09 CWHxm2/09
<i>Populus balsamifera</i> ssp. <i>trichocarpa</i> / <i>Salix sitchensis</i>	black cottonwood / Sitka willow	GNR	S2S3	Blue	CWHdm/10 CWHxm1/10 CWHxm2/10
<i>Pseudotsuga menziesii</i> - <i>Pinus</i> <i>contorta</i> / <i>Racomitrium</i> <i>canescens</i>	Douglas-fir - lodgepole pine / grey rock-moss	GNR	S2	Red	CWHxm1/02
<i>Pseudotsuga menziesii</i> / <i>Polystichum munitum</i>	Douglas-fir / sword fern	GNR	S2	Red	CWHdm/04 CWHxm1/04 CWHxm2/04
<i>Pseudotsuga menziesii</i> - <i>Tsuga</i>	Douglas-fir - western	GNR	S2S3	Blue	CWHdm/03

<i>heterophylla</i> / <i>Gaultheria shallon</i> Dry Maritime	hemlock / salal Dry Maritime				CWHxm1/03 CWHxm2/03
<i>Sidalcea hendersonii</i> Tidal Marsh	Henderson's checker- mallow Tidal Marsh	GNR	S1	Red	CWHxm1/00
<i>Spiraea douglasii</i> / <i>Carex sitchensis</i>	hardhack / Sitka sedge	GNR	S4	Yellow	CDFmm/Ws50 CWHxm1/Ws50 CWHxm2/Ws50 ICHmc1/Ws50 SBSmk1/Ws50 SBSwk1/Ws50
<i>Thuja plicata</i> / <i>Carex obnupta</i>	western redcedar / slough sedge	GNR	S2S3	Blue	CWHdm/15 CWHxm1/15 CWHxm2/15
<i>Thuja plicata</i> / <i>Lonicera involucrata</i>	western redcedar / black twinberry	GNR	S2	Red	CWHdm/14 CWHxm1/14 CWHxm2/14
<i>Thuja plicata</i> - <i>Picea sitchensis</i> / <i>Lysichiton americanus</i>	western redcedar - Sitka spruce / skunk cabbage	GNR	S3	Blue	CWHdm/12 CWHds1/12 CWHds2/12 CWHmm1/12 CWHms1/11 CWHms2/11 CWHvh1/13 CWHvh2/13 CWHvm1/14 CWHwh1/12 CWHwh2/06 CWHws1/11 CWHxm1/12 CWHxm2/12
<i>Thuja plicata</i> / <i>Polystichum munitum</i> Very Dry Maritime	western redcedar / sword fern Very Dry Maritime	GNR	S2S3	Blue	CWHxm1/05 CWHxm2/05
<i>Thuja plicata</i> / <i>Rubus spectabilis</i>	western redcedar / salmonberry	GNR	S1S2	Red	CWHdm/13 CWHxm1/13 CWHxm2/13
<i>Thuja plicata</i> / <i>Tiarella trifoliata</i> Very Dry Maritime	western redcedar / three- leaved foamflower Very Dry Maritime	GNR	S2	Red	CWHxm1/07 CWHxm2/07
<i>Trichophorum alpinum</i> / <i>Scorpidium revolvens</i>	Hudson Bay clubrush / rusty hook-moss	GNR	S2	Red	CWHxm1/Wf10 SBSmc2/Wf10 SBSmk2/Wf10
<i>Tsuga heterophylla</i> - <i>Pseudotsuga menziesii</i> / <i>Eurhynchium oreganum</i>	western hemlock - Douglas-fir / Oregon beaked-moss	GNR	S2	Red	CWHxm1/01 CWHxm2/01
<i>Tsuga heterophylla</i> - <i>Thuja plicata</i> / <i>Blechnum spicant</i>	western hemlock - western redcedar / deer fern	GNR	S2	Red	CWHdm/06 CWHxm1/06 CWHxm2/06
<i>Typha latifolia</i> Marsh	common cattail Marsh	GNR	S3	Blue	BGxh1/Wm05 BGxh2/Wm05 BGxw1/Wm05 CDFmm/Wm05 CWHdm/Wm05 CWHxm1/Wm05 CWHxm2/Wm05 IDFdk3/Wm05 IDFdm2/Wm05 PPxh1/Wm05

APPENDIX IV. SUMMARY OF RARE PLANTS & SPECIES OF SIGNIFICANCE SURVEYED BY A. AND O. CESKA IN PARKS ON SALT SPRING ISLAND, 2003-2007

Location	Name	Status	Comments
Burgoyne Bay Provincial Park (2007)	<i>Psilocarphus tenellus</i> (“Wooly heads”)	Blue-listed	On the main dirt road through the park (past the gate). Found commonly on disturbed soils, paths, dirt roads in the CDF. Waypoint #79 (10U 5404214N 0462024E)
Burgoyne Bay Provincial Park (2007)	<i>Taxus brevifolia</i> (Pacific yew)	Yellow-listed	Healthy patches of yew trees with some >30 cm dbh along the forest fringe of Burgoyne Bay. Some of the largest yew trees encountered in memory (notable records).
Mt. Erskine Provincial Park (2005)			No rare plant species encountered during the survey. Oluna completed an excellent list of fungi for the site (appended to report appendices below)
Southwestern boundary of Mt. Maxwell Provincial Park and the Ecological Reserve (2003)	<i>Clarkia amoena</i> (farewell-to-spring)	Blue-listed	Same rare Clarkia as the one that occurs on Mill Hill.
Mt. Tuam Crown Land (2007)	<i>Yabea microcarpa</i> (California hedge-parsley)	Red-listed	
Mt. Tuam Crown Land (2007)	<i>Clarkia purpurea subsp. quadrivulnera</i> (small-flowered godetia)	Red-listed	This species of Clarkia is different than the one that occurs on Mt. Maxwell, but the same as the one on Mt. Tzouhalem. Only the 5 th known site of this plant in BC. Far rarer than any other red-listed plants at Mt. Tuam.
Mt. Tuam Crown Land (2007)	<i>Viola praemorsa</i> (Yellow montane violet)	Red-listed	Located over a large area, healthy population. Many plants found under the powerline corridor.
Mt. Tuam Crown Land (2007)	<i>Idahoa scapigera</i> (scalepod)	Red-listed	
Mt. Tuam Crown Land (2007)	<i>Agoseris retrorsa?</i>	??	This could be a new species for BC (ID still a question)
Ruckle Provincial Park (2006)		A number of well known red and blue-listed plants occur in this park.	Data collected in 2006 while working with another consultant. Report was not available at the time of this project.

APPENDIX V. COMPLETE SPECIES LIST FROM 1999 SURVEY OF MOUNT MAXWELL ECOLOGICAL RESERVE BY DR. HANS ROEMER.

Checklist of Plant Species Ecological Reserve #37, Mount Maxwell (compiled April 1999 by H. Roemer)

<i>Abies grandis</i>	grand fir	<i>Grindella integrifolia</i>	gumweed
<i>Acer macrophyllum</i>	big-leaf maple	<i>Heuchera micrantha</i>	small-flowered alum-root
<i>Achillea millefolium</i>	yarrow	<i>Hieracium albiflorum</i>	white-flowered hawkweed
<i>Adenocaulon bicolor</i>	pathfinder	<i>Holcus lanatus</i>	common velvetgrass
<i>Agoseris grandiflora</i>	large-flowered agoseris	<i>Hololiscus discolor</i>	ocean spray
<i>Aira caryophylla</i>	silver hairgrass	<i>Hypochaeris radicata</i>	cat's ear
<i>Aira praecox</i>	little hairgrass	<i>Juncus effusus</i>	common rush
<i>Allium acuminatum</i>	Hooker's onion	<i>Lactuca muralis</i>	wall lettuce
<i>Ainus rubra</i>	red alder	<i>Lathyrus nevadensis</i>	Sierra peavine
<i>Anemone lyallii</i>	Lyall's anemone	<i>Linanthus bicolor</i>	bi-coloured linanthus
<i>Anthoxanthum odoratum</i>	vernal grass	<i>Linnaea borealis</i>	twinflower
<i>Aphanes arvensis</i>	field aphanes	<i>Lithophragma bulbifera</i>	bulbiferous ringcup
<i>Aquilegia formosa</i>	red columbine	<i>Lithophragma parviflora</i>	woodland star
<i>Arbutus menziesii</i>	madrone	<i>Lomatium grayi</i>	Gray's desert parsley
<i>Athysanus pusillus</i>	sandweed	<i>Lomatium utriculatum</i>	spring gold
<i>Bromus carinatus</i>	California brome	<i>Lonicera ciliosa</i>	trumpet honeysuckle
<i>Bromus hordeaceus</i>	soft brome	<i>Lonicera hispidula</i>	hairy honeysuckle
<i>Bromus rigidus</i>	rip-gut	<i>Lotus micranthus</i>	small-flowered deer-vetch
<i>Bromus sterilis</i>	barren brome	<i>Lupinus bicolor</i>	bi-coloured lupine
<i>Bromus tectorum</i>	cheatgrass	<i>Luzula multiflora</i>	field woodrush
<i>Bromus vulgaris</i>	common brome	<i>Lynchnis coronaria</i>	rose campion
<i>Calandrinia ciliata</i>	red maids	<i>Madia medioides</i>	woodland larweed
<i>Calypto bulbosa</i>	fairy slipper	<i>Mahonia aquifolium</i>	hail Oregon-grape
<i>Camassia leichtlinii</i>	great camas	<i>Mahonia nervosa</i>	dull Oregon-grape
<i>Camassia quamash</i>	early camas	<i>Meibomia subulata</i>	Alaska onion-grass
<i>Campanula scouleri</i>	Scouler's harebell	<i>Microsteris gracilis</i>	pink microsteris
<i>Cardamine oligosperma</i>	little western bittercress	<i>Mimulus alsinoides</i>	chickweed monkeyflower
<i>Cardamine pulcherrima</i> var. <i>tenella</i>	slender toothwort	<i>Mimulus guttatus</i>	common monkeyflower
<i>Carax inops</i>	long-stolon sedge	<i>Moehringia macrophylla</i>	sandwort
<i>Castilleja hispida</i>	harsh paintbrush	<i>Montia dichotoma</i>	dwarf montia
<i>Caucalis microcarpa</i>	California hedge-parsley	<i>Montia fontana</i>	blinks
<i>Cerastium arvense</i>	field chickweed	<i>Montia linearis</i>	narrow-leaved montia
<i>Cerastium vulgatum</i>	mouse-ear chickweed	<i>Montia parvifolia</i>	small-leaved montia
<i>Cirsium arvense</i>	Canada thistle	<i>Montia perforata</i>	miner's lettuce
<i>Cirsium vulgare</i>	bull thistle	<i>Montia sibirica</i>	Siberian miner's lettuce
<i>Clarkia amoena</i>	farewell to spring	<i>Montia spathulata</i>	pale montia
<i>Collinsia parviflora</i>	blue-eyed Mary	<i>Myosotis discolor</i>	yellow-and-blue forget-me-not
<i>Coralorrhiza maculata</i>	spotted coral-root	<i>Nemophila parviflora</i>	small-flowered nemophila
<i>Comus nuttallii</i>	flowering dogwood	<i>Opuntia fragilis</i>	prickly-pear cactus
<i>Cynosurus echinatus</i>	hedgehog dog-tail grass	<i>Osmorhiza chilensis</i>	sweet cicely
<i>Cystopteris fragilis</i>	brittle bladderfern	<i>Panicum occidentale</i>	western witchgrass
<i>Cytisus scoparius</i>	Scotch broom	<i>Pentagramma triangularis</i>	golden-back fern
<i>Dactylis glomerata</i>	orchard grass	<i>Perideridia gairdneri</i>	yampah root
<i>Danthonia californica</i>	California oatgrass	<i>Philadelphus lewisii</i>	mock orange
<i>Daucus pusillus</i>	American wild carrot	<i>Plantago bigelovii</i>	slender plantain
<i>Delphinium menziesii</i>	Menzies' larkspur	<i>Plantago lanceolata</i>	ribwort plantain
<i>Digitalis purpurea</i>	foxglove	<i>Plectritis congesta</i>	seablush
<i>Elymus glaucus</i>	western wildrye	<i>Poa compressa</i>	flat-stem bluegrass
<i>Epilobium</i> sp.	willow-herb	<i>Poa pratensis</i>	Kentucky bluegrass
<i>Eriophyllum lanatum</i>	woolly sunflower	<i>Polygonum spargulariaeforme</i>	fall knotweed
<i>Erodium cicutarium</i>	stork's bill	<i>Polypodium glycyrrhiza</i>	licorice fern
<i>Erythronium oregonum</i>	white fawn-lily	<i>Polystichum munifolium</i>	swordfern
<i>Festuca idahoensis</i> ssp. <i>roemerii</i>	Roemer's fescue	<i>Prunus emarginata</i>	fire cherry
<i>Festuca occidentalis</i>	western fescue	<i>Pseudotsuga menziesii</i>	Douglas-fir
<i>Festuca subuliflora</i>	crinkle-awned fescue	<i>Pteridium aquilinum</i>	bracken fern
<i>Fragaria vesca</i>	wood strawberry	<i>Quercus garryana</i>	Garry oak
<i>Fritillaria affinis</i>	chocolate lily	<i>Ranunculus occidentalis</i>	western buttercup
<i>Galium aparine</i>	cleavers	<i>Ribes lacustris</i>	swamp gooseberry
<i>Gaultheria shallon</i>	santal	<i>Ribes sanguineum</i>	red flowering currant
<i>Geranium molle</i>	dove-foot geranium	<i>Rosa gymnocarpa</i>	bold-hip rose
<i>Gnaphalium</i> sp.	cudweed	<i>Rosa nubkana</i>	Nootka rose
<i>Goodyera oblongifolia</i>	rattlesnake plantain	<i>Rubus parviflorus</i>	thimbleberry



**APPENDIX VI. LIST OF PLANTS OBSERVED DURING APRIL
10, 2003 SURVEY OF MT. MAXWELL ECOLOGICAL
RESERVE BY DR. ADOLF CESKA.**

(Updated with common names by Tania Tripp, October 2007)

**Alphabetical Scientific Name – Mount Maxwell Ecological Reserve
(CDC listed species **bold**)**

<i>Latin (Scientific name)</i>	Common Name
<i>Acer macrophyllum</i>	bigleaf maple
<i>Agoseris grandiflora</i>	large-flowered agoseris
<i>Agrostis capillaris</i>	colonial bentgrass
<i>Aira praecox</i>	early hairgrass
<i>Allium acuminatum</i>	hooker's onion
<i>Allium cernuum</i>	nodding onion
<i>Anthoxanthum odoratum</i>	vernal grass
<i>Anthriscus caucalis</i>	burr chervil
<i>Aphanes microcarpa</i>	small-fruited parsley-piert
<i>Aquilegia formosa</i>	red columbine
<i>Arbutus menziesii</i>	arbutus
<i>Arctium minus</i>	common burdock
<i>Athysanus pusillus</i>	common sandweed
<i>Brodiaea coronaria</i>	harvest coronaria
<i>Bromus vulgaris</i>	common brome
<i>Calandrinia ciliata</i>	desert rock purslane
<i>Calypto bulbosa</i>	fairy slipper
<i>Camassia quamash</i>	common camas
<i>Cardamine hirsuta</i>	hairy bitter-cress
<i>Cardamine nuttallii</i>	Nuttall's bitter-cress
<i>Cardamine occidentalis</i>	Western bitter-cress
<i>Cardamine oligosperma</i>	Siberian bitter-cress
<i>Carex inops</i>	long-stoloned sedge
<i>Cerastium arvense</i>	field chickweed
<i>Clarkia amoena.</i>	farewell-to-spring (blue-listed)
<i>Claytonia exigua</i>	pale spring beauty
<i>Claytonia perfoliata</i>	miner's lettuce
<i>Claytonia rubra</i>	red miner's lettuce
<i>Claytonia siberica</i>	Siberian miner's lettuce
<i>Clinopodium douglasii</i>	yerba buena
<i>Collinsia grandiflora var. pusilla</i>	large-flowered blue-eyed Mary

<i>Cynosurus echinatus</i>	hedgehog dog-tail grass
<i>Cystopteris fragilis</i>	fragile fern
<i>Cytisus scoparius</i>	Scotch broom
<i>Dactylis glomerata</i>	orchard grass
<i>Danthonia californica</i>	California oatgrass
<i>Digitalis purpurea</i>	foxglove
<i>Elymus glaucus</i>	blue wildrye
<i>Erodium cicutarium</i>	stork's bill
<i>Erythronium oregonum</i>	white fawn lily
<i>Festuca roemerii</i>	Roemer's fescue
<i>Festuca rubra</i>	red fescue
<i>Fritillaria affinis</i>	chocolate lily
<i>Galium aparine</i>	cleavers
<i>Geranium molle</i>	dove-foot geranium
<i>Geranium pusillum</i>	small-flowered crane's-bill
<i>Holodiscus discolor</i>	oceanspray
<i>Hypochaeris radicata</i>	hairy cat's-ear
<i>Lactuca muralis</i>	wall lettuce
<i>Lathyrus sphaericus</i>	slender wild pea
<i>Linanthus bicolor</i>	bi-coloured linanthus
<i>Lithophragma glabrum</i>	smooth woodland star
<i>Lithophragma parviflorum</i>	small-flowered woodland star
<i>Lomatium utriculatum</i>	spring gold
<i>Lonicera hispidula</i>	hairy honeysuckle
<i>Lotus micranthus</i>	small-flowered birds-foot trefoil
<i>Lychnis coronaria</i>	rose campion
<i>Mahonia aquifolium</i>	tall Oregon-grape
<i>Melica subulata</i>	Alaska oniongrass
<i>Mimulus alsinoides</i>	chickweed monkey-flower
<i>Mimulus guttatus</i>	common monkey-flower
<i>Mimulus sookensis</i>	Sooke monkey-flower
<i>Moehringia macrophylla</i>	big-leaved sandwort
<i>Montia dichotoma</i>	dwarf montia
<i>Montia fontana</i>	blinks (water chickweed)
<i>Montia howellii</i>	Howell's montia
<i>Montia parvifolia</i>	small-leaved montia
<i>Nemophila parviflora</i>	small-flowered nemophila
<i>Nemophila pedunculata</i>	meadow nemophila
<i>Osmorhiza berteroi</i>	mountain sweet-cicely
<i>Pentagramma triangularis</i>	goldenback fern



<i>Perideridia gairdneri</i>	yampah root
<i>Plectritis congesta</i>	sea blush
<i>Poa canbyi</i>	Canby bluegrass
<i>Poa pratensis</i>	Kentucky bluegrass
<i>Polypodium glycyrrhiza</i>	licorice fern
<i>Polystichum munitum</i>	sword fern
<i>Pseudotsuga menziesii</i>	Douglas fir
<i>Quercus garryana</i>	Garry oak
<i>Ranunculus occidentalis</i>	Western buttercup
<i>Rosa gymnocarpa</i>	bald-hip rose
<i>Rumex acetosella</i>	sheep sorrel
<i>Sanicula crassicaulis</i>	Pacific sanicle
<i>Saxifraga integrifolia</i>	grassland saxifrage
<i>Sedum spathulifolium</i>	broad-leaved stonecrop
<i>Selaginella wallacei</i>	Wallace's selaginella
<i>Silene gallica</i>	small-flowered catchfly
<i>Stellaria media</i>	chickweed
<i>Stellaria nitens</i>	shining starwort
<i>Taraxacum officinale</i>	common dandelion
<i>Teesdalia nudicaulis</i>	shepherd's cress
<i>Trifolium repens</i>	white clover
<i>Trifolium variegatum</i>	white-tipped clover
<i>Trifolium wormskioldii</i>	springbank clover
<i>Urtica dioica</i>	stinging nettle
<i>Verbascum thapsus</i>	great mullein
<i>Vicia lathyroides</i>	spring vetch

Alphabetical by Common Name – Mt. Maxwell Provincial Park

<i>Latin (Scientific name)</i>	<i>Common Name</i>
Alaska oniongrass	<i>Melica subulata</i>
arbutus	<i>Arbutus menziesii</i>
bald-hip rose	<i>Rosa gymnocarpa</i>
bi-coloured linanthus	<i>Linanthus bicolor</i>
bigleaf maple	<i>Acer macrophyllum</i>
big-leaved sandwort	<i>Moehringia macrophylla</i>
blinks (water chickweed)	<i>Montia fontana</i>
blue wildrye	<i>Elymus glaucus</i>
broad-leaved stonecrop	<i>Sedum spathulifolium</i>
burr chervil	<i>Anthriscus caucalis</i>



California oatgrass	<i>Danthonia californica</i>
Canby bluegrass	<i>Poa canbyi</i>
chickweed	<i>Stellaria media</i>
chickweed monkey-flower	<i>Mimulus alsinoides</i>
chocolate lily	<i>Fritillaria affinis</i>
cleavers	<i>Galium aparine</i>
colonial bentgrass	<i>Agrostis capillaris</i>
common brome	<i>Bromus vulgaris</i>
common burdock	<i>Arctium minus</i>
common camas	<i>Camassia quamash</i>
common dandelion	<i>Taraxacum officinale</i>
common monkey-flower	<i>Mimulus guttatus</i>
common sandweed	<i>Athysanus pusillus</i>
desert rock purslane	<i>Calandrinia ciliata</i>
Douglas fir	<i>Pseudotsuga menziesii</i>
dove-foot geranium	<i>Geranium molle</i>
dwarf montia	<i>Montia dichotoma</i>
early hairgrass	<i>Aira praecox</i>
fairy slipper	<i>Calypso bulbosa</i>
farewell-to-spring (blue-listed)	<i>Clarkia amoena.</i>
field chickweed	<i>Cerastium arvense</i>
foxglove	<i>Digitalis purpurea</i>
fragile fern	<i>Cystopteris fragilis</i>
Garry oak	<i>Quercus garryana</i>
goldenback fern	<i>Pentagramma triangularis</i>
grassland saxifrage	<i>Saxifraga integrifolia</i>
great mullein	<i>Verbascum thapsus</i>
hairy bitter-cress	<i>Cardamine hirsuta</i>
hairy cat's-ear	<i>Hypochaeris radicata</i>
hairy honeysuckle	<i>Lonicera hispidula</i>
harvest coronaria	<i>Brodiaea coronaria</i>
hedgehog dog-tail grass	<i>Cynosurus echinatus</i>
hooker's onion	<i>Allium acuminatum</i>
Howell's montia	<i>Montia howellii</i>
Kentucky bluegrass	<i>Poa pratensis</i>
large-flowered agoseris	<i>Agoseris grandiflora</i>
large-flowered blue-eyed Mary	<i>Collinsia grandiflora var. pusilla</i>
licorice fern	<i>Polypodium glycyrrhiza</i>
long-stoloned sedge	<i>Carex inops</i>
meadow nemophila	<i>Nemophila pedunculata</i>

miner's lettuce	<i>Claytonia perfoliata</i>
mountain sweet-cicely	<i>Osmorhiza berteroi</i>
nodding onion	<i>Allium cernuum</i>
Nuttall's bitter-cress	<i>Cardamine nuttallii</i>
oceanspray	<i>Holodiscus discolor</i>
orchard grass	<i>Dactylis glomerata</i>
Pacific sanicle	<i>Sanicula crassicaulis</i>
pale spring beauty	<i>Claytonia exigua</i>
red columbine	<i>Aquilegia formosa</i>
red fescue	<i>Festuca rubra</i>
red miner's lettuce	<i>Claytonia rubra</i>
Roemer's fescue	<i>Festuca roemerii</i>
rose campion	<i>Lychnis coronaria</i>
Scotch broom	<i>Cytisus scoparius</i>
sea blush	<i>Plectritis congesta</i>
sheep sorrel	<i>Rumex acetosella</i>
shepherd's cress	<i>Teesdalia nudicaulis</i>
shining starwort	<i>Stellaria nitens</i>
Siberian bitter-cress	<i>Cardamine oligosperma</i>
Siberian miner's lettuce	<i>Claytonia siberica</i>
slender wild pea	<i>Lathyrus sphaericus</i>
small-flowered birds-foot trefoil	<i>Lotus micranthus</i>
small-flowered catchfly	<i>Silene gallica</i>
small-flowered crane's-bill	<i>Geranium pusillum</i>
small-flowered nemophila	<i>Nemophila parviflora</i>
small-flowered woodland star	<i>Lithophragma parviflorum</i>
small-fruited parsley-piert	<i>Aphanes microcarpa</i>
small-leaved montia	<i>Montia parvifolia</i>
smooth woodland star	<i>Lithophragma glabrum</i>
Sooke monkey-flower	<i>Mimulus sookensis</i>
spring gold	<i>Lomatium utriculatum</i>
spring vetch	<i>Vicia lathyroides</i>
springbank clover	<i>Trifolium wormskioldii</i>
stinging nettle	<i>Urtica dioica</i>
stork's bill	<i>Erodium cicutarium</i>
sword fern	<i>Polystichum munitum</i>
tall Oregon-grape	<i>Mahonia aquifolium</i>
vernal grass	<i>Anthoxanthum ordoratum</i>
wall lettuce	<i>Lactuca muralis</i>
Wallace's selaginella	<i>Selaginella wallacei</i>

Western bitter-cress	<i>Cardamine occidentalis</i>
Western buttercup	<i>Ranunculus occidentalis</i>
white clover	<i>Trifolium repens</i>
white fawn lily	<i>Erythronium oregonum</i>
white-tipped clover	<i>Trifolium variegatum</i>
yampah root	<i>Perideridia gairdneri</i>
yerba buena	<i>Clinopodium douglasii</i>

Bryophytes – Mt. Maxwell

Latin (Scientific name)
Antitrichia curtispindula
Bryum sp.
Dicranum scoparium
Eurhyncium oregonum
Hedwigia stellata
Homalothecium sp.
Mnium sp.
Philonotis fontana
Polytrichum juniperinum
Polytrichum piliferum
Racomitrium elongatum
Rhytidiadelphus triquetrus
Riccia sorocarpa
Tortula sp.

Fungi – Mt. Maxwell

Latin (Scientific name)
Cortinarius subgen. *Telamonia*
Dacryomyces palmatus
Nolanea hirtipes
Psathyrella sp.
Psilocybe inquilina
Psilocybe montana

APPENDIX VII: LIST OF VASCULAR PLANTS, COMMON LICHENS AND BRYOPHYTES OF MT. ERSKINE PROVINCIAL PARK SURVEYED BY ADOLF AND OLUNA CESKA APRIL, 2005.

(Updated with common names by Tania Tripp, October 2007)

Alphabetical Scientific Name – Mt. Erskine Provincial Park

<i>Latin (Scientific name)</i>	Common Name
<i>Abies grandis</i>	grand fir
<i>Acer macrophyllum</i>	bigleaf maple
<i>Achillea millefolium</i>	yarrow
<i>Adenocaulon bicolor</i>	pathfinder
<i>Adiantum aleuticum</i>	maiden-hair fern
<i>Agoseris grandiflora</i>	large-flowered agoseris
<i>Agrostis sp.</i>	bentgrass
<i>Aira praecox</i>	early hairgrass
<i>Allium acuminatum</i>	hooker's onion
<i>Alnus rubra</i>	red alder
<i>Aphanes microcarpa</i>	small-fruited parsley-piert
<i>Arbutus menziesii</i>	arbutus
<i>Arctostaphylos columbiana</i>	hairy manzanita
<i>Athysanus pusillus</i>	common sandweed
<i>Bartramia pomiformis</i>	apple moss
<i>Brodiaea coronaria</i>	harvest coronaria
<i>Bromus vulgaris</i>	Columbia brome
<i>Bryum miniatum</i>	Bryum moss
<i>Calandrinia ciliate</i>	desert rock purslane
<i>Calypso bulbosa</i>	fairy slipper
<i>Camassia leichtlinii</i>	great camas
<i>Camassia quamash</i>	common camas
<i>Campanula scouleri</i>	Scouler's harebell
<i>Cardamine sp.</i>	bitter-cress
<i>Carex deweyana?</i>	Dewey's sedge
<i>Carex inops</i>	long-stoloned sedge
<i>Castilleja hispida</i>	harsh paintbrush
<i>Castilleja miniata?</i>	common red paintbrush
<i>Cerastium arvense</i>	field chickweed
<i>Cerastium semidecandrum</i>	mouse-ear chickweed
<i>Chimaphila umbellata</i>	prince's-pine (pipsissewa)
<i>Cirsium vulgare</i>	bull thistle
<i>Cladina portentosa?</i>	coastal reindeer lichen

<i>Claytonia parviflora</i>	narrow-leaf miner's lettuce
<i>Claytonia perfoliata</i>	miner's lettuce
<i>Claytonia rubra</i>	red miner's lettuce
<i>Clinopodium douglasii</i>	yerba buena
<i>Collinsia grandiflora var. pusilla</i>	large-flowered blue-eyed Mary
<i>Collomia heterophylla</i>	vari-leaved collomia
<i>Corallorhiza sp.</i>	coralroot
<i>Crocidium multicaule</i>	gold star
<i>Cystopteris fragilis</i>	fragile fern
<i>Cytisus scoparius</i>	Scotch broom
<i>Danthonia californica?</i>	California oatgrass
<i>Danthonia intermedia</i>	timber oat-grass
<i>Delphinium menziesii</i>	Menzies' larkspur
<i>Dendroalsia abietina</i>	plume moss
<i>Dicranum scoparium</i>	broom moss
<i>Digitalis purpurea</i>	foxglove
<i>Elymus glaucus</i>	blue wildrye
<i>Epilobium minutum?</i>	small-flowered willowherb
<i>Eriophyllum lanatum</i>	woolly eriphyllum
<i>Erythronium oregonum</i>	white fawn lily
<i>Eurhynchium oregonum</i>	Oregon beaked moss
<i>Festuca occidentalis</i>	western fescue
<i>Festuca roemeri</i>	Roemer's fescue
<i>Festuca rubra</i>	red fescue
<i>Fragaria vesca</i>	wood strawberry
<i>Fragaria virginiana</i>	wild strawberry
<i>Galium aparine</i>	cleavers
<i>Gaultheria shallon</i>	salal
<i>Goodyera oblongifolia</i>	rattlesnake plantain
<i>Heuchera micrantha</i>	small-flowered alumroot
<i>Hieracium albiflorum</i>	white hawkweed
<i>Holcus lanatus</i>	common velvet-grass
<i>Holodiscus discolor</i>	oceanspray
<i>Homalothecium sp.</i>	moss
<i>Hylocomium splendens</i>	step moss
<i>Hypochaeris radicata</i>	hairy cat's-ear
<i>Isoetecium stoloniferum</i>	cat-tail moss
<i>Juncus laccatus</i>	newly recognized
<i>Lactuca muralis</i>	wall lettuce
<i>Lathyrus nevadensis</i>	purple peavine

<i>Leucolepis acanthoneuron</i>	Menzies' tree moss
<i>Linnaea borealis</i>	twinflower
<i>Listera cordata</i>	heart-leaved twayblade
<i>Lithophragma parviflorum</i>	small-flowered woodland star
<i>Lithophragma tenellum</i>	slender woodland star
<i>Lomatium utriculatum</i>	spring gold
<i>Lonicera ciliosa</i>	Western trumpet honeysuckle
<i>Lonicera hispidula</i>	hairy honeysuckle
<i>Lotus micranthus</i>	small-flowered birds-foot trefoil
<i>Luina hypoleuca</i>	silverback luina
<i>Lupinus bicolor</i>	two-coloured lupine
<i>Luzula subsessilis</i>	short-stalked wood-rush
<i>Madia madioides</i>	forest madia
<i>Madia sp.</i>	tarweed
<i>Mahonia aquifolium</i>	tall Oregon-grape
<i>Mahonia nervosa</i>	dull Oregon-grape
<i>Melica subulata</i>	Alaska oniongrass
<i>Mimulus alsinoides</i>	chickweed monkey-flower
<i>Microsteris gracilis</i>	pink microsteris
<i>Mimulus sookensis</i>	newly recognized
<i>Moehringia macrophylla</i>	big-leaved sandwort
<i>Monotropa uniflora</i>	single delight
<i>Montia dichotoma</i>	dwarf montia
<i>Montia fontana</i>	blinks (water chickweed)
<i>Montia parvifolia</i>	small-leaved montia
<i>Myosotis discolor</i>	common forget-me-not
<i>Nemophila parviflora</i>	small-flowered nemophila
<i>Orobanche uniflora</i>	naked broomrape
<i>Osmorhiza berteroi</i>	mountain sweet-cicely
<i>Paxistima myrsinites</i>	falsebox
<i>Peltigera aphthosa</i>	gray pelt lichen
<i>Pentagramma triangularis</i>	goldenback fern
<i>Physocarpus capitatus</i>	Pacific nine-bark
<i>Pinus contorta</i>	lodgepole pine
<i>Piperia elongate? or</i>	tall rein orchid
<i>Piperia transversa</i>	royal rein orchid
<i>Plagiothecium undulatum</i>	wavy-leaved cotton moss
<i>Plectritis congesta</i>	sea blush
<i>Pogonatum macounii</i>	haircap moss
<i>Polygonum sp.</i>	smartweed

<i>Polypodium glycyrrhiza</i>	licorice fern
<i>Polystichum munitum</i>	sword fern
<i>Polytrichum juniperinum</i>	juniper haircap moss
<i>Pseudotsuga menziesii</i>	Douglas fir
<i>Quercus garryana</i>	Garry oak
<i>Racomitrium elongatum</i>	roadside rock moss
<i>Racomitrium lanuginosum</i>	woolly rock moss
<i>Rhytidiadelphus triquetrus</i>	electrified cat's-tail moss
<i>Rhytidiopsis robusta</i>	pipecleaner moss
<i>Ribes sanguineum</i>	red-flowering currant
<i>Rosa gymnocarpa</i>	bald-hip rose
<i>Rubus parviflorus</i>	thimbleberry
<i>Rubus ursinus</i>	trailing blackberry
<i>Rumex acetosella</i>	sheep sorrel
<i>Sanicula crassicaulis</i>	Pacific sanicle
<i>Saxifraga ferruginea</i>	Alaska saxifrage
<i>Saxifraga integrifolia</i>	grassland saxifrage
<i>Saxifraga rufidula</i>	rusty-haired saxifrage
<i>Scapania sp.</i>	liverwort
<i>Sedum spathulifolium</i>	broad-leaved stonecrop
<i>Selaginella wallacei</i>	Wallace's selaginella
<i>Senecio jacobaea</i>	tansy ragwort
<i>Senecio vulgaris</i>	common groundsel
<i>Stellaria crispa?</i>	crisp starwort
<i>Stellaria nitens</i>	shining starwort
<i>Stereocaulon sp.</i>	lichen
<i>Symphoricarpos albus</i>	common snowberry
<i>Symphoricarpos hesperius</i>	trailing snowberry
<i>Taraxacum officinale</i>	common dandelion
<i>Targionia hypophylla</i>	orobus-seed liverwort
<i>Trachybryum megaptilum</i>	giant fern moss
<i>Trientalis borealis</i>	broad-leaved starflower
<i>Trifolium oliganthum</i>	few-flowered clover
<i>Trifolium sp.</i>	clover
<i>Trifolium variegatum</i>	white-tipped clover
<i>Trifolium willdenowii</i>	tomcat clover
<i>Tsuga heterophylla</i>	western hemlock
<i>Urtica dioica var. lyallii</i>	stinging nettle
<i>Vaccinium parvifolium</i>	red huckleberry
<i>Viola sempervirens</i>	trailing yellow violet

Alphabetical by Common Name – Mt. Erskine Provincial Park

Common Name	Latin (Scientific name)
Alaska oniongrass	<i>Melica subulata</i>
Alaska saxifrage	<i>Saxifraga ferruginea</i>
apple moss	<i>Bartramia pomiformis</i>
arbutus	<i>Arbutus menziesii</i>
bald-hip rose	<i>Rosa gymnocarpa</i>
bentgrass	<i>Agrostis sp.</i>
bigleaf maple	<i>Acer macrophyllum</i>
big-leaved sandwort	<i>Moehringia macrophylla</i>
bitter-cress	<i>Cardamine sp.</i>
blinks (water chickweed)	<i>Montia fontana</i>
blue wildrye	<i>Elymus glaucus</i>
broad-leaved starflower	<i>Trientalis borealis</i>
broad-leaved stonecrop	<i>Sedum spathulifolium</i>
broom moss	<i>Dicranum scoparium</i>
Bryum moss	<i>Bryum miniatum</i>
bull thistle	<i>Cirsium vulgare</i>
California oatgrass	<i>Danthonia californica?</i>
cat-tail moss	<i>Isoetecium stoloniferum</i>
chickweed monkey-flower	<i>Mimulus alsinoides</i>
cleavers	<i>Galium aparine</i>
clover	<i>Trifolium sp.</i>
coastal reindeer lichen	<i>Cladina portentosa?</i>
Columbia brome	<i>Bromus vulgaris</i>
common camas	<i>Camassia quamash</i>
common dandelion	<i>Taraxacum officinale</i>
common forget-me-not	<i>Myosotis discolor</i>
common groundsel	<i>Senecio vulgaris</i>
common red paintbrush	<i>Castilleja miniata?</i>
common sandweed	<i>Athysanus pusillus</i>
common snowberry	<i>Symphoricarpos albus</i>
common velvet-grass	<i>Holcus lanatus</i>
coralroot	<i>Corallorhiza sp.</i>
crisp starwort	<i>Stellaria crispa?</i>
desert rock purslane	<i>Calandrinia ciliate</i>
Dewey's sedge	<i>Carex deweyana?</i>
Douglas fir	<i>Pseudotsuga menziesii</i>
dull Oregon-grape	<i>Mahonia nervosa</i>
dwarf montia	<i>Montia dichotoma</i>

early hairgrass	<i>Aira praecox</i>
electrified cat's-tail moss	<i>Rhytidiadelphus triquetrus</i>
fairy slipper	<i>Calypso bulbosa</i>
falsebox	<i>Paxistima myrsinites</i>
few-flowered clover	<i>Trifolium oliganthum</i>
field chickweed	<i>Cerastium arvense</i>
forest madia	<i>Madia madioides</i>
foxglove	<i>Digitalis purpurea</i>
fragile fern	<i>Cystopteris fragilis</i>
Garry oak	<i>Quercus garryana</i>
giant fern moss	<i>Trachybryum megaptilum</i>
gold star	<i>Crocidium multicaule</i>
goldenback fern	<i>Pentagramma triangularis</i>
grand fir	<i>Abies grandis</i>
grassland saxifrage	<i>Saxifraga integrifolia</i>
gray pelt lichen	<i>Peltigera aphthosa</i>
great camas	<i>Camassia leichtlinii</i>
haircap moss	<i>Pogonatum macounii</i>
hairy cat's-ear	<i>Hypochaeris radicata</i>
hairy honeysuckle	<i>Lonicera hispidula</i>
hairy manzanita	<i>Arctostaphylos columbiana</i>
harsh paintbrush	<i>Castilleja hispida</i>
harvest coronaria	<i>Brodiaea coronaria</i>
heart-leaved twayblade	<i>Listera cordata</i>
hooker's onion	<i>Allium acuminatum</i>
juniper haircap moss	<i>Polytrichum juniperinum</i>
large-flowered agoseris	<i>Agoseris grandiflora</i>
large-flowered blue-eyed Mary	<i>Collinsia grandiflora var. pusilla</i>
lichen	<i>Stereocaulon sp.</i>
licorice fern	<i>Polypodium glycyrrhiza</i>
liverwort	<i>Scapania sp.</i>
lodgepole pine	<i>Pinus contorta</i>
long-stoloned sedge	<i>Carex inops</i>
maiden-hair fern	<i>Adiantum aleuticum</i>
Menzies' larkspur	<i>Delphinium menziesii</i>
Menzies' tree moss	<i>Leucolepis acanthoneuron</i>
miner's lettuce	<i>Claytonia perfoliata</i>
moss	<i>Homalothecium sp.</i>
mountain sweet-cicely	<i>Osmorhiza berteroi</i>
mouse-ear chickweed	<i>Cerastium semidecandrum</i>

naked broomrape	<i>Orobanche uniflora</i>
narrow-leaf miner's lettuce	<i>Claytonia parviflora</i>
newly recognized	<i>Juncus laccatus</i>
newly recognized	<i>Mimulus sookensis</i>
oceanspray	<i>Holodiscus discolor</i>
Oregon beaked moss	<i>Eurhynchium oreganum</i>
orobus-seed liverwort	<i>Targionia hypophylla</i>
Pacific nine-bark	<i>Physocarpus capitatus</i>
Pacific sanicle	<i>Sanicula crassicaulis</i>
pathfinder	<i>Adenocaulon bicolor</i>
pink microsteris	<i>Microsteris gracilis</i>
pipecleaner moss	<i>Rhytidiopsis robusta</i>
plume moss	<i>Dendroalsia abietina</i>
prince's-pine (pipsissewa)	<i>Chimaphila umbellata</i>
purple peavine	<i>Lathyrus nevadensis</i>
rattlesnake plantain	<i>Goodyera oblongifolia</i>
red alder	<i>Alnus rubra</i>
red fescue	<i>Festuca rubra</i>
red huckleberry	<i>Vaccinium parvifolium</i>
red miner's lettuce	<i>Claytonia rubra</i>
red-flowering currant	<i>Ribes sanguineum</i>
roadside rock moss	<i>Racomitrium elongatum</i>
Roemer's fescue	<i>Festuca roemeri</i>
royal rein orchid	<i>Piperia transversa</i>
rusty-haired saxifrage	<i>Saxifraga rufidula</i>
salal	<i>Gaultheria shallon</i>
Scotch broom	<i>Cytisus scoparius</i>
Scouler's harebell	<i>Campanula scouleri</i>
sea blush	<i>Plectritis congesta</i>
sheep sorrel	<i>Rumex acetosella</i>
shining starwort	<i>Stellaria nitens</i>
short-stalked wood-rush	<i>Luzula subsessilis</i>
silverback luina	<i>Luina hypoleuca</i>
single delight	<i>Monotropa uniflora</i>
slender woodland star	<i>Lithophragma tenellum</i>
small-flowered alumroot	<i>Heuchera micrantha</i>
small-flowered birds-foot trefoil	<i>Lotus micranthus</i>
small-flowered nemophila	<i>Nemophila parviflora</i>
small-flowered willowherb	<i>Epilobium minutum?</i>
small-flowered woodland star	<i>Lithophragma parviflorum</i>

small-fruited parsley-piert	<i>Aphanes microcarpa</i>
small-leaved montia	<i>Montia parvifolia</i>
smartweed	<i>Polygonum sp.</i>
spring gold	<i>Lomatium utriculatum</i>
step moss	<i>Hylocomium splendens</i>
stinging nettle	<i>Urtica dioica var. lyallii</i>
sword fern	<i>Polystichum munitum</i>
tall Oregon-grape	<i>Mahonia aquifolium</i>
tall rein orchid	<i>Piperia elongate? or</i>
tansy ragwort	<i>Senecio jacobaea</i>
tarweed	<i>Madia sp.</i>
thimbleberry	<i>Rubus parviflorus</i>
timber oat-grass	<i>Danthonia intermedia</i>
tomcat clover	<i>Trifolium willdenowii</i>
trailing blackberry	<i>Rubus ursinus</i>
trailing snowberry	<i>Symphoricarpos hesperius</i>
trailing yellow violet	<i>Viola sempervirens</i>
twinflower	<i>Linnaea borealis</i>
two-coloured lupine	<i>Lupinus bicolor</i>
vari-leaved collomia	<i>Collomia heterophylla</i>
wall lettuce	<i>Lactuca muralis</i>
Wallace's selaginella	<i>Selaginella wallacei</i>
wavy-leaved cotton moss	<i>Plagiothecium undulatum</i>
western fescue	<i>Festuca occidentalis</i>
western hemlock	<i>Tsuga heterophylla</i>
western trumpet honeysuckle	<i>Lonicera ciliosa</i>
white fawn lily	<i>Erythronium oregonum</i>
white hawkweed	<i>Hieracium albiflorum</i>
white-tipped clover	<i>Trifolium variegatum</i>
wild strawberry	<i>Fragaria virginiana</i>
wood strawberry	<i>Fragaria vesca</i>
woolly eriophyllum	<i>Eriophyllum lanatum</i>
woolly rock moss	<i>Racomitrium lanuginosum</i>
yarrow	<i>Achillea millefolium</i>
yerba buena	<i>Clinopodium douglasii</i>

Erskine Mtn. Apr. 4, and April 20, 2005 (Oluna Ceska)

List of macrofungi

Agrocybe praecox
Amanita pantherina
Auriscalpium vulgare
Callistosporium luteo-olivaceum
Cantharellus tubaeformis
Ciboria rufofusca
Clavulina rugosa
Clitocybe radicellata
Clitocybe sinopica
Clitocybe vibecina
Collybia maculata
Crepidotus lundelii
Fomitopsis pinicola
Galerina subbadipes
Ganoderma applanatum
Geopyxis vulcanalis
Guepiniopsis alpinus
Gyromitra aesculenta
Helvella compressa
Inocybe cicatricata
Inocybe flocculosa f. flocculosa
Inocybe geophylla
Inocybe jacobi
Inocybe lacera
Inocybe nitidiuscula
Inocybe subcarpta
Marasmiellus candidus
Melanoleuca stridula
Micromphale perforans
Mycena alcalina
Mycena pura
Naucoria escharoides
Nolanea cetrata f. cetrata
Nolanea cetrata f. minimospora
Nolanea hirtipes
Nolanea holoconiota
Nolanea sericea
Nolanea strictia

Nolanea verna v. isodiametrica

Omphalina ericetorum

Omphalina obscurata

Peziza repanda

Pseudoplectania melaena

Psilocybe crobula

Psilocybe montana

Tricholoma saponaceum

Tubaria hiemalis

Verpa conica

APPENDIX VIII: LIST OF PLANTS OBSERVED DURING SURVEY OF BURGOYNE BAY PROVINCIAL PARK BY ADOLF AND OLUNA CESKA IN JUNE OF 2007.

(Updated with common names by Tania Tripp, October 2007)

Alphabetical Scientific Name - (CDC listed species **bold) – Burgoyne Bay Provincial Park**

<i>Latin (Scientific name)</i>	Common Name
<i>Abies grandis</i>	grand fir
<i>Acer macrophyllum</i>	bigleaf maple
<i>Adenocaulon bicolor</i>	pathfinder
<i>Alnus rubra</i>	red alder
<i>Anthoxanthum odoratum</i>	vernal grass
<i>Aquilegia formosa</i>	red columbine
<i>Arbutus menziesii</i>	arbutus
<i>Arctium minus</i>	common burdock
<i>Athyrium filix-femina</i>	lady fern
<i>Bellis perennis</i>	English daisy
<i>Bromus vulgaris</i>	common brome
<i>Calypso bulbosa</i>	fairy slipper
<i>Campanula scouleri</i>	Scouler's harebell
<i>Carex deweyana</i>	Dewey's sedge
<i>Castilleja hispida</i>	harsh paintbrush
<i>Circaea alpina</i>	Enchanter's nightshade
<i>Claytonia siberica</i>	Siberian miner's lettuce
<i>Coprinus micaceus</i>	Mica cap (fungi)
<i>Corallorhiza maculata</i>	spotted coral-root
<i>Cynosurus echinatus</i>	hedgehog dog-tail grass
<i>Dactylis glomerata</i>	orchard grass
<i>Epipactis helleborine</i>	common hellebore
<i>Equisetum arvense</i>	common horsetail
<i>Festuca occidentalis</i>	western fescue
<i>Fragaria vesca</i>	wood strawberry
<i>Galium aparine</i>	cleavers
<i>Galium triflorum</i>	sweet-scented bedstraw
<i>Gaultheria shallon</i>	salal
<i>Geum macrophyllum</i>	large-leaved avens
<i>Goodyera oblongifolia</i>	rattlesnake plantain
<i>Hedera helix</i>	English ivy

<i>Hieracium albiflorum</i>	white hawkweed
<i>Holodiscus discolor</i>	oceanspray
<i>Hypochaeris radicata</i>	hairy cat's-ear
<i>Juncus lacatus</i>	newly recognized
<i>Lactuca muralis</i>	wall lettuce
<i>Lathyrus nevadensis</i>	purple peavine
<i>Linnaea borealis</i>	twinflower
<i>Lonicera ciliosa</i>	Western trumpet honeysuckle
<i>Lonicera hispidula</i>	hairy honeysuckle
<i>Luzula subsessilis</i>	short-stalked wood-rush
<i>Madia madioides</i>	forest madia
<i>Mahonia aquifolium</i>	tall Oregon-grape
<i>Mahonia nervosa</i>	dull Oregon-grape
<i>Melica subulata</i>	Alaska oniongrass
<i>Mitella ovalis</i>	oval-leaved mitrewort
<i>Nemophila parviflora</i>	small-flowered nemophila
<i>Oemleria cerasiformis</i>	Indian plum
<i>Osmorhiza berteroi</i>	mountain sweet-cicely
<i>Piperia elongate?</i>	tall rein orchid
<i>Plantago major</i>	common plantain
<i>Plectritis congesta</i>	sea blush
<i>Polystichum munitum</i>	sword fern
<i>Prunella vulgaris</i>	self-heal
<i>Psathyrella candolleana</i>	common Psathyrella (fungi)
<i>Pseudotsuga menziesii</i>	Douglas fir
<i>Psilocarphus tenellus</i>	“Wooly heads” (blue-listed)
<i>Pteridium aquilinum</i>	bracken fern
<i>Pyrola “aphylla”</i>	leafless wintergreen
<i>Quercus garryana</i>	Garry oak
<i>Ranunculus acris</i>	meadow buttercup
<i>Ranunculus repens</i>	creeping buttercup
<i>Ranunculus uncinatus</i>	small-flowered buttercup
<i>Ribes bracteosum</i>	stink currant
<i>Ribes lacustre</i>	swamp gooseberry
<i>Rosa gymnocarpa</i>	bald-hip rose
<i>Rubus parviflorus</i>	thimbleberry
<i>Rubus spectabilis</i>	salmonberry
<i>Rubus ursinus</i>	trailing blackberry
<i>Rumex obtusifolius?</i>	bitter/broadleaved dock
<i>Sanicula crassicaulis</i>	Pacific sanicle

<i>Stachys chamissonis</i>	Chamisso's hedge nettle
<i>Stellaria crispa?</i>	crisp starwort
<i>Stellaria media</i>	chickweed
<i>Symphoricarpos albus</i>	common snowberry
<i>Symphoricarpos hesperius</i>	trailing snowberry
<i>Taraxacum officinale</i>	common dandelion
<i>Taxus brevifolia</i>	Pacific yew
<i>Tellima grandiflora</i>	fringecup
<i>Thuja plicata</i>	Western redcedar
<i>Trientalis borealis/latifolia</i>	broad-leaved starflower
<i>Urtica dioica</i>	stinging nettle
<i>Vaccinium parvifolium</i>	red huckleberry
<i>Veronica americana</i>	American brooklime
<i>Vicia tetrasperma</i>	Lentil vetch
<i>Viola glabella</i>	stream violet

Alphabetical by Common Name – Burgoyne Bay Provincial Park

Common Name	Latin (Scientific name)
Alaska oniongrass	<i>Melica subulata</i>
American brooklime	<i>Veronica americana</i>
arbutus	<i>Arbutus menziesii</i>
bald-hip rose	<i>Rosa gymnocarpa</i>
bigleaf maple	<i>Acer macrophyllum</i>
bitter/broadleaved dock	<i>Rumex obtusifolius?</i>
bracken fern	<i>Pteridium aquilinum</i>
broad-leaved starflower	<i>Trientalis borealis/latifolia</i>
Chamisso's hedge nettle	<i>Stachys chamissonis</i>
chickweed	<i>Stellaria media</i>
cleavers	<i>Galium aparine</i>
common brome	<i>Bromus vulgaris</i>
common burdock	<i>Arctium minus</i>
common dandelion	<i>Taraxacum officinale</i>
common hellebore	<i>Epipactis helleborine</i>
common horsetail	<i>Equisetum arvense</i>
common plantain	<i>Plantago major</i>
common Psathyrella (fungi)	<i>Psathyrella candolleana</i>
common snowberry	<i>Symphoricarpos albus</i>
creeping buttercup	<i>Ranunculus repens</i>
crisp starwort	<i>Stellaria crispa?</i>
Dewey's sedge	<i>Carex deweyana</i>

Douglas fir	<i>Pseudotsuga menziesii</i>
dull Oregon-grape	<i>Mahonia nervosa</i>
Enchanter's nightshade	<i>Circaea alpina</i>
English daisy	<i>Bellis perennis</i>
English ivy	<i>Hedera helix</i>
fairy slipper	<i>Calypso bulbosa</i>
forest madia	<i>Madia madioides</i>
fringecup	<i>Tellima grandiflora</i>
Garry oak	<i>Quercus garryana</i>
grand fir	<i>Abies grandis</i>
hairy cat's-ear	<i>Hypochaeris radicata</i>
hairy honeysuckle	<i>Lonicera hispidula</i>
harsh paintbrush	<i>Castilleja hispida</i>
hedgehog dog-tail grass	<i>Cynosurus echinatus</i>
Indian plum	<i>Oemleria cerasiformis</i>
lady fern	<i>Athyrium filix-femina</i>
large-leaved avens	<i>Geum macrophyllum</i>
leafless wintergreen	<i>Pyrola "aphylla"</i>
Lentil vetch	<i>Vicia tetrasperma</i>
meadow buttercup	<i>Ranunculus acris</i>
Mica cap (fungi)	<i>Coprinus micaceus</i>
mountain sweet-cicely	<i>Osmorhiza berteroi</i>
newly recognized	<i>Juncus laccatus</i>
oceanspray	<i>Holodiscus discolor</i>
orchard grass	<i>Dactylis glomerata</i>
oval-leaved mitrewort	<i>Mitella ovalis</i>
Pacific sanicle	<i>Sanicula crassicaulis</i>
Pacific yew	<i>Taxus brevifolia</i>
pathfinder	<i>Adenocaulon bicolor</i>
purple peavine	<i>Lathyrus nevadensis</i>
rattlesnake plantain	<i>Goodyera oblongifolia</i>
red alder	<i>Alnus rubra</i>
red columbine	<i>Aquilegia formosa</i>
red huckleberry	<i>Vaccinium parvifolium</i>
salal	<i>Gaultheria shallon</i>
salmonberry	<i>Rubus spectabilis</i>
Scouler's harebell	<i>Campanula scouleri</i>
sea blush	<i>Plectritis congesta</i>
self-heal	<i>Prunella vulgaris</i>
short-stalked wood-rush	<i>Luzula subsessilis</i>

Siberian miner's lettuce	<i>Claytonia siberica</i>
small-flowered buttercup	<i>Ranunculus uncinatus</i>
small-flowered nemophila	<i>Nemophila parviflora</i>
spotted coral-root	<i>Corallorhiza maculata</i>
stinging nettle	<i>Urtica dioica</i>
stink currant	<i>Ribes bracteosum</i>
stream violet	<i>Viola glabella</i>
swamp gooseberry	<i>Ribes lacustre</i>
sweet-scented bedstraw	<i>Galium triflorum</i>
sword fern	<i>Polystichum munitum</i>
tall Oregon-grape	<i>Mahonia aquifolium</i>
tall rein orchid	<i>Piperia elongate?</i>
thimbleberry	<i>Rubus parviflorus</i>
trailing blackberry	<i>Rubus ursinus</i>
trailing snowberry	<i>Symphoricarpos hesperius</i>
twinflower	<i>Linnaea borealis</i>
vernal grass	<i>Anthoxanthum odoratum</i>
wall lettuce	<i>Lactuca muralis</i>
western fescue	<i>Festuca occidentalis</i>
Western redcedar	<i>Thuja plicata</i>
Western trumpet honeysuckle	<i>Lonicera ciliosa</i>
white hawkweed	<i>Hieracium albiflorum</i>
wood strawberry	<i>Fragaria vesca</i>
“Wooly heads” (blue-listed)	<i>Psilocarphus tenellus</i>

APPENDIX IX. LIST OF PLANTS OBSERVED DURING 2007 SURVEY OF MT. TUAM ECOLOGICAL RESERVE AND ADJACENT CROWN LAND BY ADOLF AND OLUNA CESKA.

(Updated with common names by Tania Tripp, October 2007)

Alphabetical Scientific Name (CDC listed species **bold) – Mount Tuam Ecological Reserve and Adjacent Crown Lands Assessment Areas**

<i>Latin (Scientific name)</i>	<i>Common Name</i>
<i>Acer macrophyllum</i>	bigleaf maple
<i>Achillea millefolium</i>	yarrow
<i>Agoseris grandiflora</i>	large-flowered agoseris
<i>Agoseris retrorsa?</i>	Could be a new species for BC (ID still in question) mountain dandelion
<i>Agrostis scabra</i>	hair bentgrass
<i>Aira praecox</i>	early hairgrass
<i>Allium acuminatum</i>	hooker's onion
<i>Allium cernuum</i>	nodding onion
<i>Alnus rubra</i>	red alder
<i>Anthoxanthum odoratum</i>	vernal grass
<i>Aphanes microcarpa</i>	small-fruited parsley-piert
<i>Arabis glabra</i>	tower rockcress
<i>Arbutus menziesii</i>	arbutus
<i>Arctium minus</i>	common burdock
<i>Arenaria serphyllifolia</i>	thymeleaf sandwort
<i>Athysanus pusillus</i>	common sandweed
<i>Brodiaea coronaria</i>	harvest coronaria
<i>Bryum miniatum</i>	Bryum moss
<i>Calandrinia ciliata</i>	desert rock purslane
<i>Camassia leichtlinii</i>	great camas
<i>Camassia quamash</i>	common camas
<i>Campanula scouleri</i>	Scouler's harebell
<i>Cardamine nuttallii</i>	Nuttall's bitter-cress
<i>Cardamine sp.</i>	bitter-cress
<i>Carex garberi</i>	Elk sedge
<i>Carex hoodii</i>	Hood's sedge
<i>Carex inops</i>	long-stoloned sedge
<i>Cerastium arvense</i>	field chickweed
<i>Cerastium glomeratum</i>	Sticky chickweed
<i>Cerastium semidecandrum</i>	mouse-ear chickweed

<i>Cirsium vulgare</i>	bull thistle
<i>Clarkia amoena</i>	farewell-to-spring (blue-listed)
<i>Clarkia purpurea</i>	four-spotted clarkia (red-listed)
<i>Claytonia perfoliata</i>	miner's lettuce
<i>Claytonia rubra</i>	red miner's lettuce
<i>Clinopodium douglasii</i>	yerba buena
<i>Collinsia grandiflora</i> var. <i>pusilla</i>	large-flowered blue-eyed Mary
<i>Corallorhiza maculata</i>	spotted coral-root
<i>Crataegus monogyna</i>	common hawthorn
<i>Cynosurus echinatus</i>	hedgehog dog-tail grass
<i>Cystopteris fragilis</i>	fragile fern
<i>Dactylis glomerata</i>	orchard grass
<i>Danthonia californica</i>	California oatgrass
<i>Danthonia intermedia</i>	timber oat-grass
<i>Daucus pirsillus</i>	American wild carrot
<i>Delphinium menziesii</i>	Menzies' larkspur
<i>Digitalis purpurea</i>	foxglove
<i>Dodecatheon hendersonii</i>	broad-leaved shooting star
<i>Draba verna</i>	common draba
<i>Elymus glaucus</i>	blue wildrye
<i>Epilobium brachycarpum</i>	tall annual willow herb
<i>Epilobium minutum</i>	small-flowered willowherb
<i>Eriophyllum lanatum</i>	woolly eriphyllum
<i>Erodium cicutarium</i>	stork's bill
<i>Erythronium oregonum</i>	white fawn lily
<i>Festuca roemeri</i>	Roemer's fescue
<i>Festuca rubra</i>	red fescue
<i>Fragaria vesca</i>	wood strawberry
<i>Fragaria virginiana</i>	wild strawberry
<i>Fritillaria affinis</i>	chocolate lily
<i>Galium aparine</i>	cleavers
<i>Geranium molle</i>	dove-foot geranium
<i>Geranium pusillum</i>	small-flowered crane's-bill
<i>Gnaphalium purpureum</i>	purple cudweed
<i>Grindelia integrifolia</i>	gumweed
<i>Holodiscus discolor</i>	oceanspray
<i>Hypericum perforatum</i>	common St. John's wort
<i>Hypochaeris glabra</i>	smooth cat's ear
<i>Hypochaeris radicata</i>	hairy cat's-ear
<i>Idahoia scapigera</i>	oldstem Idahoa (red-listed)

<i>Juncus effuses</i>	common rush
<i>Juncus ensifolius</i>	swordleaf rush
<i>Lathyrus nevadensis</i>	purple peavine
<i>Linanthus bicolor</i>	bi-coloured linanthus
<i>Lithophragma glabrum</i>	smooth woodland star
<i>Lithophragma parviflorum</i>	small-flowered woodland star
<i>Lomatium utriculatum</i>	spring gold
<i>Lonicera hispidula</i>	hairy honeysuckle
<i>Lotus micranthus</i>	small-flowered birds-foot trefoil
<i>Lupinus bicolor</i>	two-coloured lupine
<i>Luzula subsessilis</i>	short-stalked wood-rush
<i>Lychnis coronaria</i>	rose campion
<i>Madia glomerata</i>	clustered tarweed
<i>Mahonia aquifolium</i>	tall Oregon-grape
<i>Marrubium vulgare</i>	horehound
<i>Mimulus alsinoides</i>	chickweed monkey-flower
<i>Mimulus guttatus</i>	common monkey-flower
<i>Mimulus sookensis</i>	Sooke monkey-flower
<i>Montia dichotoma</i>	dwarf montia
<i>Montia fontana</i>	blinks (water chickweed)
<i>Myosotis discolor</i>	common forget-me-not
<i>Nemophila parviflora</i>	small-flowered nemophila
<i>Opuntia fragilis</i>	prickly-pear cactus
<i>Orobanche uniflora</i>	naked broomrape
<i>Osmorhiza berteroi</i>	mountain sweet-cicely
<i>Paxistima myrsinites</i>	falsebox
<i>Pentagramma triangularis</i>	goldenback fern
<i>Perideridia gairdneri</i>	yampah root
<i>Piperia sp.</i>	Rein orchid
<i>Plantago lanceolata</i>	ribwort plantain
<i>Pleuridium subulatum</i>	Pleuridium moss
<i>Poa canbyi</i>	Canby bluegrass
<i>Polygonum sp.</i>	smartweed
<i>Polypodium glycyrrhiza</i>	licorice fern
<i>Polystichum munitum</i>	sword fern
<i>Polytrichum juniperinum</i>	juniper haircap moss
<i>Prunella vulgaris</i>	self-heal
<i>Pseudotsuga menziesii</i>	Douglas fir
<i>Psilocybe Montana</i>	potent Psilocybe (mushroom)
<i>Pteridium aquilinum</i>	bracken fern

<i>Quercus garryana</i>	Garry oak
<i>Racomitrium elongatum</i>	roadside rock moss
<i>Ranunculus occidentalis</i>	Western buttercup
<i>Ribes lobbii</i>	gummy goose-berry
<i>Rosa gymnocarpa</i>	bald-hip rose
<i>Rubus ursinus</i>	trailing blackberry
<i>Rumex acetosella</i>	sheep sorrel
<i>Sanicula crassicaulis</i> var. <i>cassicaulis</i>	Pacific sanicle
<i>Sanicula crassicaulis</i> var. <i>tripartite</i>	gamble weed
<i>Saxifraga integrifolia</i>	grassland saxifrage
<i>Sedum spathulifolium</i>	broad-leaved stonecrop
<i>Selaginella wallacei</i>	Wallace's selaginella
<i>Senecio vulgaris</i>	common groundsel
<i>Sherardia arvensis</i>	field madder
<i>Silene gallica</i>	small-flowered catchfly
<i>Spiranthes romanzoffiana</i>	ladie's tresses
<i>Stellaria media</i>	chickweed
<i>Stellaria nitens</i>	shining starwort
<i>Symphoricarpos albus</i>	common snowberry
<i>Taraxacum officinale</i>	common dandelion
<i>Teesdalia nudicaulis</i>	shepherd's cress
<i>Torilis arvensis</i>	spreading hedge parsley
<i>Tragopogon porrifolius?</i>	oyster plant
<i>Trifolium microcephalum</i>	small-headed clover
<i>Trifolium microdon</i>	Thimble clover
<i>Trifolium</i> sp.	clover
<i>Trifolium variegatum</i>	white-tipped clover
<i>Trifolium willdenowii</i>	tomcat clover
<i>Triphysaria pusilla</i>	Dwarf owl's clover
<i>Triteleia hyacinthine</i>	Fool's onion
<i>Urtica dioica</i>	stinging nettle
<i>Verbascum thapsus</i>	great mullein
<i>Veronica arvensis</i>	Corn speedwell
<i>Vicia lathyroides</i>	spring vetch
<i>Vicia sativa</i>	Common vetch
<i>Viola adunca</i>	Early blue violet
<i>Viola praemorsa</i>	Yellow montane violet (red-listed)
<i>Zigadenus venenosus</i>	Meadow death-camas

Alphabetical by Common Name – Mt. Tuam Ecological Reserve and Adjacent Crown Land Parcels

Common Name	Latin (Scientific name)
American wild carrot	<i>Daucus pirsillus</i>
arbutus	<i>Arbutus menziesii</i>
bald-hip rose	<i>Rosa gymnocarpa</i>
bi-coloured linanthus	<i>Linanthus bicolor</i>
bigleaf maple	<i>Acer macrophyllum</i>
bitter-cress	<i>Cardamine sp.</i>
blinks (water chickweed)	<i>Montia fontana</i>
blue wildrye	<i>Elymus glaucus</i>
bracken fern	<i>Pteridium aquilinum</i>
broad-leaved shooting star	<i>Dodecatheon hendersonii</i>
broad-leaved stonecrop	<i>Sedum spathulifolium</i>
Bryum moss	<i>Bryum miniatum</i>
bull thistle	<i>Cirsium vulgare</i>
California oatgrass	<i>Danthonia californica</i>
Canby bluegrass	<i>Poa canbyi</i>
chickweed	<i>Stellaria media</i>
chickweed monkey-flower	<i>Mimulus alsinoides</i>
chocolate lily	<i>Fritillaria affinis</i>
cleavers	<i>Galium aparine</i>
clover	<i>Trifolium sp.</i>
clustered tarweed	<i>Madia glomerata</i>
common burdock	<i>Arctium minus</i>
common camas	<i>Camassia quamash</i>
common dandelion	<i>Taraxacum officinale</i>
common draba	<i>Draba verna</i>
common forget-me-not	<i>Myosotis discolor</i>
common groundsel	<i>Senecio vulgaris</i>
common hawthorn	<i>Crataegus monogyna</i>
common monkey-flower	<i>Mimulus guttatus</i>
common rush	<i>Juncus effuses</i>
common sandweed	<i>Athysanus pusillus</i>
common snowberry	<i>Symphoricarpos albus</i>
common St. John's wort	<i>Hypericum perforatum</i>
Common vetch	<i>Vicia sativa</i>
Corn speedwell	<i>Veronica arvensis</i>
desert rock purslane	<i>Calandrinia ciliata</i>
Douglas fir	<i>Pseudotsuga menziesii</i>

dove-foot geranium	<i>Geranium molle</i>
dwarf montia	<i>Montia dichotoma</i>
Dwarf owl's clover	<i>Triphysaria pusilla</i>
Early blue violet	<i>Viola adunca</i>
early hairgrass	<i>Aira praecox</i>
Elk sedge	<i>Carex garberi</i>
falsebox	<i>Paxistima myrsinites</i>
farewell-to-spring (blue-listed)	<i>Clarkia amoena</i>.
field chickweed	<i>Cerastium arvense</i>
field madder	<i>Sherardia arvensis</i>
Fool's onion	<i>Triteleia hyacinthine</i>
four-spotted clarkia (red-listed)	<i>Clarkia purpurea</i>
foxglove	<i>Digitalis purpurea</i>
fragile fern	<i>Cystopteris fragilis</i>
gamble weed	<i>Sanicula crassicaulis</i> var. <i>tripartite</i>
Garry oak	<i>Quercus garryana</i>
goldenback fern	<i>Pentagramma triangularis</i>
grassland saxifrage	<i>Saxifraga integrifolia</i>
great camas	<i>Camassia leichtlinii</i>
great mullein	<i>Verbascum thapsus</i>
gummy goose-berry	<i>Ribes lobbii</i>
gumweed	<i>Grindelia integrifolia</i>
hair bentgrass	<i>Agrostis scabra</i>
hairy cat's-ear	<i>Hypochaeris radicata</i>
hairy honeysuckle	<i>Lonicera hispidula</i>
harvest coronaria	<i>Brodiaea coronaria</i>
hedgehog dog-tail grass	<i>Cynosurus echinatus</i>
Hood's sedge	<i>Carex hoodii</i>
hooker's onion	<i>Allium acuminatum</i>
horehound	<i>Marrubium vulgare</i>
juniper haircap moss	<i>Polytrichum juniperinum</i>
ladie's tresses	<i>Spiranthes romanzoffiana</i>
large-flowered agoseris	<i>Agoseris grandiflora</i>
large-flowered blue-eyed Mary	<i>Collinsia grandiflora</i> var. <i>pusilla</i>
licorice fern	<i>Polypodium glycyrrhiza</i>
long-stoloned sedge	<i>Carex inops</i>
Meadow death-camas	<i>Zigadenus venenosus</i>
Menzies' larkspur	<i>Delphinium menziesii</i>
miner's lettuce	<i>Claytonia perfoliata</i>
mountain dandelion Could be a new species for BC (ID still in question)	<i>Agoseris retrorsa?</i>

mountain sweet-cicely	<i>Osmorhiza berteroi</i>
mouse-ear chickweed	<i>Cerastium semidecandrum</i>
naked broomrape	<i>Orobanche uniflora</i>
nodding onion	<i>Allium cernuum</i>
Nuttall's bitter-cress	<i>Cardamine nuttallii</i>
oceanspray	<i>Holodiscus discolor</i>
oldstem Idahoa (red-listed)	<i>Idahoa scapigera</i>
orchard grass	<i>Dactylis glomerata</i>
oyster plant	<i>Tragopogon porrifolius?</i>
Pacific sanicle	<i>Sanicula crassicaulis</i> var. <i>cassicaulis</i>
Pleuridium moss	<i>Pleuridium subulatum</i>
potent Psilocybe (mushroom)	<i>Psilocybe Montana</i>
prickly-pear cactus	<i>Opuntia fragilis</i>
purple cudweed	<i>Gnaphalium purpureum</i>
purple peavine	<i>Lathyrus nevadensis</i>
red alder	<i>Alnus rubra</i>
red fescue	<i>Festuca rubra</i>
red miner's lettuce	<i>Claytonia rubra</i>
Rein orchid	<i>Piperia</i> sp.
ribwort plantain	<i>Plantago lanceolata</i>
roadside rock moss	<i>Racomitrium elongatum</i>
Roemer's fescue	<i>Festuca roemeri</i>
rose campion	<i>Lychnis coronaria</i>
Scouler's harebell	<i>Campanula scouleri</i>
self-heal	<i>Prunella vulgaris</i>
sheep sorrel	<i>Rumex acetosella</i>
shepherd's cress	<i>Teesdalia nudicaulis</i>
shining starwort	<i>Stellaria nitens</i>
short-stalked wood-rush	<i>Luzula subsessilis</i>
small-flowered birds-foot trefoil	<i>Lotus micranthus</i>
small-flowered catchfly	<i>Silene gallica</i>
small-flowered crane's-bill	<i>Geranium pusillum</i>
small-flowered nemophila	<i>Nemophila parviflora</i>
small-flowered willowherb	<i>Epilobium minutum</i>
small-flowered woodland star	<i>Lithophragma parviflorum</i>
small-fruited parsley-piert	<i>Aphanes microcarpa</i>
small-headed clover	<i>Trifolium microcephalum</i>
smartweed	<i>Polygonum</i> sp.
smooth cat's ear	<i>Hypochaeris glabra</i>
smooth woodland star	<i>Lithophragma glabrum</i>

Sooke monkey-flower	<i>Mimulus sookensis</i>
spotted coral-root	<i>Corallorhiza maculata</i>
spreading hedge parsley	<i>Torilis arvensis</i>
spring gold	<i>Lomatium utriculatum</i>
spring vetch	<i>Vicia lathyroides</i>
Sticky chickweed	<i>Cerastium glomeratum</i>
stinging nettle	<i>Urtica dioica</i>
stork's bill	<i>Erodium cicutarium</i>
sword fern	<i>Polystichum munitum</i>
swordleaf rush	<i>Juncus ensifolius</i>
tall annual willow herb	<i>Epilobium brachycarpum</i>
tall Oregon-grape	<i>Mahonia aquifolium</i>
Thimble clover	<i>Trifolium microdon</i>
thymeleaf sandwort	<i>Arenaria serphyllifolia</i>
timber oat-grass	<i>Danthonia intermedia</i>
tomcat clover	<i>Trifolium willdenowii</i>
tower rockcress	<i>Arabis glabra</i>
trailing blackberry	<i>Rubus ursinus</i>
two-coloured lupine	<i>Lupinus bicolor</i>
vernal grass	<i>Anthoxanthum odoratum</i>
Wallace's selaginella	<i>Selaginella wallacei</i>
Western buttercup	<i>Ranunculus occidentalis</i>
white fawn lily	<i>Erythronium oregonum</i>
white-tipped clover	<i>Trifolium variegatum</i>
wild strawberry	<i>Fragaria virginiana</i>
wood strawberry	<i>Fragaria vesca</i>
woolly eriophyllum	<i>Eriophyllum lanatum</i>
yampah root	<i>Perideridia gairdneri</i>
yarrow	<i>Achillea millefolium</i>
Yellow montane violet (red-listed)	<i>Viola praemorsa</i>
yerba buena	<i>Clinopodium douglasii</i>

APPENDIX X: BIRDS, BUTTERFLIES, MOTHS AND MAMMALS OF BURGOYNE BAY PROVINCIAL PARK

List collected by Karen Ferguson (local naturalist and resident of Salt Spring Island)

Birds		
Horned grebe	Hairy woodpecker*	Townsend's warbler*
Double-crested cormorant	Northern flicker*	Common yellowthroat*
Great blue heron	Pileated woodpecker*	Wilson's warbler*
Mute swan	Pacific slope flycatcher*	Yellow warbler
Canada goose	Olive-sided flycatcher*	Yellow-rumped warbler-Myrtle
Greater white-fronted goose	Willow flycatcher*	Black-throated grey warbler
Mallard	Northern shrike	MacGillivray's warbler
American wigeon	Warbling vireo*	Western tanager
Common goldeneye	Hutton's vireo*	Spotted towhee*
Barrow's goldeneye	Cassin's vireo*	Savannah sparrow*
Bufflehead	Cedar waxwing*	White-crowned sparrow*
Hooded merganser	Stellar's jay*	Golden-crowned sparrow
Common merganser	Common raven*	Song sparrow**
Red-breasted merganser	Northwestern crow	Lincoln's sparrow
Turkey vulture	Violet-green swallow*	Dark-eyed junco
Sharp-shinned hawk	Tree swallow**	Purple finch**
Red-tailed hawk*	Barn swallow**	Red crossbill
Golden eagle	Chestnut-backed chickadee*	Pine siskin
Bald eagle*	Bushtit	American goldfinch
California quail*	Red-breasted nuthatch*	Chipping sparrow
Blue grouse*	Brown creeper**	Black-headed grosbeak*
Ruffed grouse*	Bewick's wren*	Brown-headed cowbird*
Mew gull	House wren	
Glaucous-winged gull	Winter wren**	
Band-tailed pigeon (blue-listed)*	Golden-crowned kinglet	
Barn owl (remains found by barn) (blue-listed)*	Ruby-crowned kinglet	
Western screech owl	Varied thrush	
Great horned owl	American robin*	
Barred owl	Swainson's thrush	
Rufous hummingbird*	European starling**	
Belted kingfisher**	Orange-crowned warbler*	
Red-breasted sapsucker**	Audubon's-yellow rumped warbler	
Downy woodpecker*		

*witnessed evidence of nesting behavior; **witnessed actual nesting

Butterflies	Moths	Mammals
Satyr Anglewing	Half-white Carpet	Raccoon
Morning Cloak	Isabella Moth	River Otter
Pale Tiger Swallowtail		Harbour Seal
Western Tiger Swallowtail		Black-tailed Deer
Woodland Skipper		Red Squirrel
Propertius Duskywing (blue-listed)		Short-tailed Weasel
Cabbage White		Deer Mouse
Sara's Orangetip		Townsend's Vole
Brown Elfin		Unidentified Bats
Gray Hairstreak		Feral Cat
Spring Azure		
Red Admiral		
Anise swallowtail		
Lorquin's admiral		
Common wood nymph		
Mylitta crescent		
Pine White		

APPENDIX XI. CONSERVATION RANKINGS FOR EACH PARK POLYGON.

Table VII-1. Mount Erskine Provincial Park

Location	Polygon	Decile	Step 1			Step 2		Step 3		Step 4					Step 5		
			1a	1b	1 RANK 1	2 RANK 2	3 RANK 3	4a	4b	4c	4d	4e	4 RANK 4	WEIGHTED VALUE			
Mt. Erskine Prov. Park	776	1	3	3	0.66	3	0.66	3	0.66	3	1	5	2	2.75	0.66	0.660	
Mt. Erskine Prov. Park	782	2	1	1	1	1	1	1	1	2	1	3	1	1.75	0.83	0.966	
Mt. Erskine Prov. Park	799	1	2	2	0.83	2	0.83	2	0.83	3	4	5	2	3.50	0.49	0.762	
Mt. Erskine Prov. Park	801	2	3	3	0.66	3	0.66	3	0.66	3	4	3	1	2.75	0.66	0.660	
Mt. Erskine Prov. Park	1514	2	3	3	0.66	3	0.66	3	0.66	1	2	3	1	1.75	0.83	0.694	
Mt. Erskine Prov. Park	1515	2	2	2	0.83	2	0.83	2	0.83	2	4	3	1	2.50	0.66	0.796	
Mt. Erskine Prov. Park	1523	1	3	3	0.66	3	0.66	3	0.66	3	1	5	2	2.75	0.66	0.660	
Mt. Erskine Prov. Park	1526	1	1	1	1	1	1	1	1	3	1	5	2	2.75	0.66	0.932	
Mt. Erskine Prov. Park	1530	2	1	1	1	1	1	1	1	1	1	5	1	2.00	0.83	0.966	
Mt. Erskine Prov. Park	1532	2	1	1	1	1	1	1	1	3	2	3	1	2.25	0.66	0.932	
Mt. Erskine Prov. Park	1542	3	3	3	0.66	3	0.66	3	0.66	2	1	3	1	1.75	0.83	0.694	
Mt. Erskine Prov. Park	1543	1	2	2	0.83	2	0.83	2	0.83	2	2	3	2	2.25	0.66	0.796	
Mt. Erskine Prov. Park	1544	2	2	2	0.83	2	0.83	2	0.83	1	2	3	2	6	2.80	0.66	0.796
Mt. Erskine Prov. Park	1545	3		1	1	1	1	1	1	2	1	5	1	2.25	0.66	0.932	
Mt. Erskine Prov. Park	1546	1	6	6	0.16	6	0.16	6	0.16	1	6	3	2	3.00	0.66	0.260	
Mt. Erskine Prov. Park	1548	1	2	2	0.83	2	0.83	2	0.83	3	1	5	1	2.50	0.66	0.796	
Mt. Erskine Prov. Park	1549	1	2	2	0.83	2	0.83	2	0.83	3	2	5	2	3.00	0.66	0.796	
Mt. Erskine Prov. Park	1550	2	3	3	0.66	3	0.66	3	0.66	3	1	1	1	1.50	0.83	0.694	
Mt. Erskine Prov. Park	1551	1	2	2	0.83	2	0.83	2	0.83	2	6	3	2	3.25	0.49	0.762	
Mt. Erskine Prov. Park	1552	1	3	3	0.66	3	0.66	3	0.66	2	1	3	1	2	1.80	0.83	0.694
Mt. Erskine Prov. Park	1553	3	2	2	0.83	2	0.83	2	0.83	2	2	3	1	2.00	0.83	0.830	
Mt. Erskine Prov. Park	1714	2		1	1	1	1	1	1	3	1	5	1	2.50	0.66	0.932	

Table VII-2. Burgoyne Bay Provincial Park and Addition.

Location	Polygon	Decile	Step 1			Step 2		Step 3		Step 4						Step 5
			1a	1b	RANK 1	2	RANK 2	3	RANK 3	4a	4b	4c	4d	4e	4	RANK 4
Burgoyne Bay Addition	326	2	1	1	1	1	1	1	1	3	3	5	2	3.25	0.49	0.898
Burgoyne Bay Addition	1330	2	3	3	0.66	3	0.66	3	0.66	3	4	5	2	3.50	0.49	0.626
Burgoyne Bay Addition	1341	2	2	2	0.83	2	0.83	2	0.83	1	4	1	1	1.75	0.83	0.830
Burgoyne Bay Addition	1343	1	3	3	0.66	3	0.66	3	0.66	2	2	3	2	2.25	0.66	0.660
Burgoyne Bay Addition	1347	2	1	1	1	1	1	1	1	3	2	5	1	2.75	0.66	0.932
Burgoyne Bay Addition	1349	1	2	2	0.83	2	0.83	2	0.83	3	4	3	2	3.00	0.66	0.796
Burgoyne Bay Addition	1353	1	1	1	1	1	1	1	1	2	6	3	6	4.25	0.32	0.864
Burgoyne Bay Addition	1355	1	3	3	0.66	3	0.66	3	0.66	3	1	3	2	2.25	0.66	0.660
Burgoyne Bay Addition	1359	2	5	5	0.32	5	0.32	5	0.32	2	6	5	2	3.75	0.49	0.354
Burgoyne Bay Addition	1361	3	2	2	0.83	2	0.83	2	0.83	1	6	3	1	2.75	0.66	0.796
Burgoyne Bay Addition	1363	2	2	2	0.83	2	0.83	2	0.83	1	4	3	2	2.50	0.66	0.796
Burgoyne Bay Addition	1365	2	2	2	0.83	2	0.83	2	0.83	3	4	5	2	3.50	0.49	0.762
Burgoyne Bay Addition	1366	2	1	1	1	1	1	1	1	3	2	3	1	2.25	0.66	0.932
Burgoyne Bay Addition	1367	1	1	1	1	1	1	1	1	3	4	3	6	4.00	0.49	0.898
Burgoyne Bay Addition	1369	1	5	5	0.32	5	0.32	5	0.32	3	6	3	6	4.50	0.32	0.320
Burgoyne Bay Addition	1371	1	2	2	0.83	2	0.83	2	0.83	1	2	3	1	1.75	0.83	0.830
Burgoyne Bay Addition	1372	1	2	2	0.83	2	0.83	2	0.83	1	2	3	6	3.00	0.66	0.796
Burgoyne Bay Addition	1373	2	5	5	0.32	5	0.32	5	0.32	3	6	3	6	4.50	0.32	0.320
Burgoyne Bay Addition	1374	1	5	5	0.32	5	0.32	5	0.32	3	6	3	6	4.50	0.32	0.320
Burgoyne Bay Addition	1379	1	3	3	0.66	3	0.66	3	0.66	3	2	5	1	2.75	0.66	0.660
Burgoyne Bay Addition	1601	1	2	2	0.83	2	0.83	2	0.83	1	4	3	2	2.50	0.66	0.796
Burgoyne Bay Addition	1737	1	2	2	0.83	2	0.83	2	0.83	3	4	5	2	3.50	0.49	0.762
Burgoyne Bay Prov. Park	416	1	5	5	0.32	5	0.32	5	0.32	3	6	3	6	4.50	0.32	0.320
Burgoyne Bay Prov. Park	418	1	3	3	0.66	3	0.66	3	0.66	3	6	5	6	5.00	0.32	0.592

Location	Polygon	Decile	Step 1			Step 2		Step 3		Step 4						Step 5
			1a	1b	RANK 1	2	RANK 2	3	RANK 3	4a	4b	4c	4d	4e	4	RANK 4
Burgoyne Bay Prov. Park	427	2	2	2	0.83	2	0.83	2	0.83	3	1	3	1	2.00	0.83	0.830
Burgoyne Bay Prov. Park	432	1	5	5	0.32	5	0.32	5	0.32	3	6	3	2	6	4.00	0.49
Burgoyne Bay Prov. Park	435	1	1	1	1	1	1	1	1	3	6	5	1	6	4.20	0.32
Burgoyne Bay Prov. Park	442	1	3	3	0.66	3	0.66	3	0.66	3	1	3	1	2.00	0.83	0.694
Burgoyne Bay Prov. Park	443	1	5	5	0.32	5	0.32	5	0.32	3	6	3	6	4.50	0.32	0.320
Burgoyne Bay Prov. Park	449	1	5	5	0.32	5	0.32	5	0.32	1	6	3	5	6	4.20	0.32
Burgoyne Bay Prov. Park	450	1	2	2	0.83	2	0.83	2	0.83	3	4	3	6	4.00	0.49	0.762
Burgoyne Bay Prov. Park	452	1	3	3	0.66	3	0.66	3	0.66	3	2	1	6	3.00	0.66	0.660
Burgoyne Bay Prov. Park	453	1	6	6	0.16	6	0.16	6	0.16	3	6	3	5	6	4.60	0.32
Burgoyne Bay Prov. Park	458	1	2	2	0.83	2	0.83	2	0.83	2	1	3	2	2.00	0.83	0.830
Burgoyne Bay Prov. Park	460	1	1	1	1	1	1	1	1	1	6	3	2	6	3.60	0.49
Burgoyne Bay Prov. Park	461	1	3	3	0.66	3	0.66	3	0.66	3	6	1	6	4.00	0.49	0.626
Burgoyne Bay Prov. Park	469	1	1	1	1	1	1	1	1	2	6	3	1	6	3.60	0.49
Burgoyne Bay Prov. Park	471	1	2	2	0.83	2	0.83	2	0.83	3	4	1	6	3.50	0.49	0.762
Burgoyne Bay Prov. Park	472	1	5	5	0.32	5	0.32	5	0.32	3	6	3	5	6	4.60	0.32
Burgoyne Bay Prov. Park	474	1	3	3	0.66	3	0.66	3	0.66	3	4	5	1	2	3.00	0.66
Burgoyne Bay Prov. Park	479	1	3	3	0.66	3	0.66	3	0.66	3	1	5	1	2.50	0.66	0.660
Burgoyne Bay Prov. Park	483	1	5	5	0.32	5	0.32	4	0.49	3	6	3	5	6	4.60	0.32
Burgoyne Bay Prov. Park	484	1	2	2	0.83	2	0.83	2	0.83	3	2	3	1	6	3.00	0.66
Burgoyne Bay Prov. Park	487	1	2	2	0.83	2	0.83	2	0.83	3	1	3	2	2.25	0.66	0.796
Burgoyne Bay Prov. Park	489	1	3	3	0.66	3	0.66	3	0.66	3	6	5	1	6	4.20	0.32
Burgoyne Bay Prov. Park	490	2	3	3	0.66	3	0.66	3	0.66	2	1	3	2	2.00	0.83	0.694
Burgoyne Bay Prov. Park	492	2	2	2	0.83	2	0.83	2	0.83	2	2	3	2	2.25	0.66	0.796
Burgoyne Bay Prov. Park	493	3	1	1	1	1	1	1	1	3	1	3	1	2.00	0.83	0.966
Burgoyne Bay Prov. Park	497	1	3	3	0.66	3	0.66	3	0.66	3	1	5	6	3.75	0.49	0.626

Location	Polygon	Decile	Step 1			Step 2		Step 3		Step 4						Step 5		
			1a	1b	RANK 1	2	RANK 2	3	RANK 3	4a	4b	4c	4d	4e	4	RANK 4	WEIGHTED VALUE	
Burgoyne Bay Prov. Park	499	1	1	1	1	1	1	1	1	3	1	3	6	3.25	0.49	0.898		
Burgoyne Bay Prov. Park	513	1		3	3	0.66	3	0.66	3	0.66	2	6	3	5	6	4.40	0.32	0.592
Burgoyne Bay Prov. Park	514	1	2	2	0.83	2	0.83	2	0.83	3	4	3	2	6	3.60	0.49	0.762	
Burgoyne Bay Prov. Park	516	1	5	5	0.32	5	0.32	5	0.32	3	6	3	6	4.50	0.32	0.320		
Burgoyne Bay Prov. Park	518	1	6	6	0.16	6	0.16	6	0.16	3	6	3	6	4.50	0.32	0.192		
Burgoyne Bay Prov. Park	519	3	2	2	0.83	2	0.83	2	0.83	3	4	3	2	1	2.60	0.66	0.796	
Burgoyne Bay Prov. Park	524	2	1	1	1	1	1	1	1	3	1	3	1	2.00	0.83	0.966		
Burgoyne Bay Prov. Park	528	1	3	3	0.66	3	0.66	3	0.66	3	1	3	2	2.25	0.66	0.660		
Burgoyne Bay Prov. Park	531	2	2	2	0.83	2	0.83	2	0.83	3	4	3	2	1	2.60	0.66	0.796	
Burgoyne Bay Prov. Park	534	1		5	5	0.32	5	0.32	5	0.32	1	6	3	5	6	4.20	0.32	0.320
Burgoyne Bay Prov. Park	544	2	1	1	1	1	1	1	1	1	2	3	2	2.00	0.83	0.966		
Burgoyne Bay Prov. Park	546	2	2	2	0.83	2	0.83	2	0.83	1	2	3	2	2.00	0.83	0.830		
Burgoyne Bay Prov. Park	547	1		1	1	1	1	1	1	2	1	3	1	1.75	0.83	0.966		
Burgoyne Bay Prov. Park	556	1		1	1	1	1	1	1	3	1	1	1	1.50	0.83	0.966		
Burgoyne Bay Prov. Park	558	1	2	2	0.83	2	0.83	2	0.83	1	1	3	1	1.50	0.83	0.830		
Burgoyne Bay Prov. Park	566	2	3	3	0.66	3	0.66	3	0.66	2	2	3	1	2.00	0.83	0.694		
Burgoyne Bay Prov. Park	586	2	2	2	0.83	2	0.83	2	0.83	1	1	3	1	1	1.40	0.83	0.830	
Burgoyne Bay Prov. Park	597	1	1	1	1	1	1	1	1	1	1	3	1	1.50	0.83	0.966		
Burgoyne Bay Prov. Park	1376	3	2	2	0.83	2	0.83	2	0.83	2	1	3	1	1.75	0.83	0.830		
Burgoyne Bay Prov. Park	1377	1	1	1	1	1	1	1	1	3	2	3	6	3.50	0.49	0.898		
Burgoyne Bay Prov. Park	1378	1	3	3	0.66	3	0.66	3	0.66	3	6	1	6	4.00	0.49	0.626		
Burgoyne Bay Prov. Park	1380	1	2	2	0.83	2	0.83	2	0.83	3	1	3	6	3.25	0.49	0.762		
Burgoyne Bay Prov. Park	1381	2	3	3	0.66	3	0.66	3	0.66	2	1	1	1	1.25	0.83	0.694		
Burgoyne Bay Prov. Park	1566	2	1	1	1	1	1	1	1	3	2	3	1	2	2.20	0.66	0.932	
Burgoyne Bay Prov. Park	1649	1	1	1	1	1	1	1	1	3	1	3	2	2.25	0.66	0.932		

Location	Polygon	Decile	Step 1			Step 2		Step 3		Step 4						Step 5	
			1a	1b	RANK 1	2	RANK 2	3	RANK 3	4a	4b	4c	4d	4e	4	RANK 4	WEIGHTED VALUE
Burgoyne Bay Prov. Park	1651	1	5	5	0.32	5	0.32	5	0.32	3	6	3	5	6	4.60	0.32	0.320
Burgoyne Bay Prov. Park	1652	2	1	1	1	1	1	1	1	2	4	3	6	3.75	0.49	0.898	
Burgoyne Bay Prov. Park	1654	1	5	5	0.32	5	0.32	5	0.32	3	6	3	6	4.50	0.32	0.320	
Burgoyne Bay Prov. Park	1726	1	2	2	0.83	2	0.83	2	0.83	3	1	3	1	2.00	0.83	0.830	
Burgoyne Bay Prov. Park	1727	1	2	2	0.83	2	0.83	2	0.83	3	1	5	1	2.50	0.66	0.796	
Burgoyne Bay Prov. Park	1728	1	3	3	0.66	3	0.66	3	0.66	3	1	3	2	2.25	0.66	0.660	

Table VII-3. Mount Maxwell Provincial Park

Polygon	Polygon	Decile	Step 1			Step 2		Step 3		Step 4						Step 5
			1a	1b	RANK 1	RANK 2	RANK 3	4a	4b	4c	4d	4e	RANK 4	WEIGHTED VALUE		
Provincial Park	528	1	3	3	0.66	3	0.66	3	0.66	3	1	3	2	2.25	0.66	0.660
Provincial Park	534	1		5	0.32	5	0.32	5	0.32	1	6	3	1	6	3.40	0.49
Provincial Park	539	1	3	3	0.66	3	0.66	3	0.66	3	1	3	1	2.00	0.83	0.694
Provincial Park	546	2	2	2	0.83	2	0.83	2	0.83	1	2	3	2	2.00	0.83	0.830
Provincial Park	547	1		1	1	1	1	1	1	2	1	3	1	1.75	0.83	0.966
Provincial Park	566	2	3	3	0.66	3	0.66	3	0.66	2	2	3	1	2.00	0.83	0.694
Provincial Park	575	1		1	1	1	1	1	1	3	1	3	1	2.00	0.83	0.966
Provincial Park	582	1	2	2	0.83	2	0.83	2	0.83	3	2	5	2	3.00	0.66	0.796
Provincial Park	590	1	2	2	0.83	2	0.83	2	0.83	1	1	1	2	1.25	0.83	0.830
Provincial Park	608	1	2	2	0.83	2	0.83	2	0.83	3	4	3	6	4.00	0.49	0.762
Provincial Park	613	2	3	3	0.66	3	0.66	3	0.66	2	2	5	2	2.75	0.66	0.660
Provincial Park	615	2		1	1	1	1	1	1	2	1	3	1	1.75	0.83	0.966
Provincial Park	632	1	2	2	0.83	2	0.83	2	0.83	1	1	3	1	1.50	0.83	0.830
Provincial Park	646	1	1	1	1	1	1	1	1	1	1	3	1	1.50	0.83	0.966
Provincial Park	1384	1	2	2	0.83	2	0.83	2	0.83	2	4	3	2	2.75	0.66	0.796
Provincial Park	1385	1		1	1	1	1	1	1	6	1	1	1	2.25	0.66	0.932
Provincial Park	1386	1	1	1	1	1	1	1	1	1	1	3	1	2	1.60	0.83
Provincial Park	1387	1	2	2	0.83	2	0.83	2	0.83	3	4	3	6	4.00	0.49	0.762
Provincial Park	1391	1	3	3	0.66	3	0.66	3	0.66	3	1	1	1	1.50	0.83	0.694
Provincial Park	1392	2	1	1	1	1	1	1	1	2	1	3	2	2.00	0.83	0.966
Provincial Park	1569	3		1	1	1	1	1	1	3	1	3	1	2.00	0.83	0.966
Provincial Park	1593	1	1	1	1	1	1	1	1	3	1	3	6	3.25	0.49	0.898
Provincial Park	1595	2	2	2	0.83	2	0.83	2	0.83	1	4	3	6	3.50	0.49	0.762
Provincial Park	1602	1	3	3	0.66	3	0.66	3	0.66	3	2	5	1	2.75	0.66	0.660

Polygon	Polygon	Decile	Step 1			Step 2		Step 3		Step 4						Step 5
			1a	1b	1 RANK 1	2	RANK 2	3	RANK 3	4a	4b	4c	4d	4e	4	RANK 4
Provincial Park	1649	1	1	1	1	1	1	1	1	3	1	3	2	2.25	0.66	0.932
Provincial Park	1650	1	2	2	0.83	2	0.83	2	0.83	3	1	5	2	2.75	0.66	0.796
Provincial Park	1725	1	2	2	0.83	2	0.83	2	0.83	2	1	3	2	2.00	0.83	0.830

Table VII-4. Mount Maxwell Ecological Reserve

Polygon	Polygon	Decile	Step 1			Step 2		Step 3		Step 4						Step 5
			1a	1b	RANK 1	2	RANK 2	3	RANK 3	4a	4b	4c	4d	4e	4	RANK 4
Ecological Reserve	544	2	1	1	1	1	1	1	1	1	2	3	2	2.00	0.83	0.966
Ecological Reserve	558	1	2	2	0.83	2	0.83	2	0.83	1	1	3	1	1.50	0.83	0.830
Ecological Reserve	586	2	2	2	0.83	2	0.83	2	0.83	1	1	3	1	1.50	0.83	0.830
Ecological Reserve	597	1	1	1	1	1	1	1	1	1	1	3	1	1.50	0.83	0.966
Ecological Reserve	600	2	1	1	1	1	1	1	1	2	1	3	1	1.75	0.83	0.966
Ecological Reserve	606	3	3	3	0.66	3	0.66	3	0.66	2	1	5	1	2.25	0.66	0.660
Ecological Reserve	618	1	1	1	1	1	1	1	1	3	1	1	1	1.50	0.83	0.966
Ecological Reserve	625	1		1	1	1	1	1	1	3	1	3	1	2.00	0.83	0.966
Ecological Reserve	645	1	1	1	1	1	1	1	1		1	5	2	2.67	0.66	0.932
Ecological Reserve	650	2	2	2	0.83	2	0.83	2	0.83	3	1	3	1	2.00	0.83	0.830
Ecological Reserve	654	1	2	2	0.83	2	0.83	2	0.83	3	1	3	2	2.25	0.66	0.796
Ecological Reserve	655	2	2	2	0.83	2	0.83	2	0.83	2	1	3	2	2.00	0.83	0.830
Ecological Reserve	659	2	1	1	1	1	1	1	1	1	1	3	1	1.50	0.83	0.966
Ecological Reserve	660	2	1	1	1	1	1	1	1	2	1	5	1	2.25	0.66	0.932
Ecological Reserve	671	2	2	2	0.83	2	0.83	2	0.83	1	1	3	1	1.50	0.83	0.830
Ecological Reserve	672	3		1	1	1	1	1	1	2	1	3	1	1.75	0.83	0.966
Ecological Reserve	681	2	3	3	0.66	3	0.66	3	0.66	3	1	3	1	2.00	0.83	0.694
Ecological Reserve	684	2	1	1	1	1	1	1	1	3	1	3	1	2.00	0.83	0.966
Ecological Reserve	686	2	3	3	0.66	3	0.66	3	0.66	3	1	3	2	2.25	0.66	0.660
Ecological Reserve	690	2	3	3	0.66		1		1	3	1	5	1	2.50	0.66	0.762
Ecological Reserve	703	2		1	1	1	1	1	1	2	1	3	1	1.75	0.83	0.966
Ecological Reserve	707	2	1	1	1	1	1	1	1	1	1	3	1	1.50	0.83	0.966
Ecological Reserve	715	2	1	1	1	1	1	1	1	2	1	3	1	1.75	0.83	0.966
Ecological Reserve	719	1	1	1	1	1	1	1	1	2	1	1	1	1.25	0.83	0.966

Polygon	Polygon	Decile	Step 1			Step 2		Step 3		Step 4						Step 5
			1a	1b	1 RANK 1	2	RANK 2	3	RANK 3	4a	4b	4c	4d	4e	4	RANK 4
Ecological Reserve	721	1	2	2	0.83	2	0.83	2	0.83	3	1	5	2	2.75	0.66	0.796
Ecological Reserve	722	2		1	1	1	1	1	1	3	1	3	1	2.00	0.83	0.966
Ecological Reserve	726	1	1	1	1	1	1	1	1	3	2	3	2	2.50	0.66	0.932
Ecological Reserve	735	1	1	1	1	1	1	1	1	2	1	3	1	1.75	0.83	0.966
Ecological Reserve	1395	2		1	1	1	1	1	1	3	2	3	1	2.25	0.66	0.932
Ecological Reserve	1398	1	5	5	0.32	5	0.32	5	0.32	3	6	3	2	3.50	0.49	0.354
Ecological Reserve	1399	2	2	2	0.83	2	0.83	2	0.83	3	1	3	2	2.25	0.66	0.796
Ecological Reserve	1401	1	5	5	0.32	5	0.32	5	0.32	3	6	5	6	5.00	0.32	0.320
Ecological Reserve	1402	1	2	2	0.83	2	0.83	2	0.83	3	4	5	2	3.50	0.49	0.762
Ecological Reserve	1406	2	2	2	0.83	2	0.83	2	0.83	3	4	1	2	2.50	0.66	0.796
Ecological Reserve	1410	2	1	1	1	1	1	1	1	3	2	3	1	2.25	0.66	0.932
Ecological Reserve	1411	2	1	1	1	1	1	1	1	3	1	3	2	2.25	0.66	0.932
Ecological Reserve	1415	2	3	3	0.66	3	0.66	3	0.66	2	2	5	2	2.75	0.66	0.660
Ecological Reserve	1594	1	2	2	0.83	2	0.83	2	0.83	2	1	3	2	2.00	0.83	0.830
Ecological Reserve	1636	2	1	1	1	1	1	1	1	3	1	5	1	2.50	0.66	0.932
Ecological Reserve	1637	1	2	2	0.83	2	0.83	2	0.83	6	1	5	2	3.50	0.49	0.762
Ecological Reserve	1638	2	3	3	0.66	3	0.66	3	0.66	3	1	5	1	2.50	0.66	0.660
Ecological Reserve	1639	2	2	2	0.83	2	0.83	2	0.83	6	1	5	1	3.25	0.49	0.762
Ecological Reserve	1640	1	2	2	0.83	2	0.83	2	0.83	3	1	5	1	2.50	0.66	0.796
Ecological Reserve	1641	2	3	3	0.66	3	0.66	3	0.66	3	1	5	1	2.50	0.66	0.660
Ecological Reserve	1648	1	3	3	0.66	3	0.66	3	0.66	1	1	5	1	2.00	0.83	0.694
Ecological Reserve	1721	1	1	1	1	1	1	1	1	3	1	5	1	2.50	0.66	0.932
Ecological Reserve	1722	2	2	2	0.83	2	0.83	2	0.83	3	1	5	2	2.75	0.66	0.796

Table VII-5. Ruckle and Beaver Point Provincial Parks and Cusheon Cove Addition.

Polygon	Polygon	Decile	Step 1			Step 2		Step 3		Step 4						Step 5		
			1a	1b	1 RANK 1	2 RANK 2	3 RANK 3	4a	4b	4c	4d	4e	4 RANK 4	WEIGHTED VALUE				
Beaver Point Prov. Park	263	1	2	2	0.83	2	0.83	2	0.83	3	3	5	1	6	3.60	0.49	0.762	
Beaver Point Prov. Park	272	1	1	1	1	1	1	1	1	3	3	5		2	3.25	0.49	0.898	
Beaver Point Prov. Park	278	1	2	2	0.83	2	0.83	2	0.83	3	3	3		6	3.75	0.49	0.762	
Beaver Point Prov. Park	286	1	2	2	0.83	2	0.83	2	0.83	3	2	3		2	2.50	0.66	0.796	
Beaver Point Prov. Park	334	1	2	2	0.83	2	0.83	2	0.83	2	1	3		2	2.00	0.83	0.830	
Beaver Point Prov. Park	335	1	3	3	0.66	3	0.66	3	0.66	3	3	2	1	3	2.40	0.66	0.660	
Beaver Point Prov. Park	336	2	3	3	0.66	3	0.66	3	0.66	1	2	3		1	1.75	0.83	0.694	
Beaver Point Prov. Park	384	2	1	1	1	1	1	1	1	1	1	3	2	6	2.60	0.66	0.932	
Ruckle Provincial Park	273	2	1	1	1	1	1	1	1	1	2	3		2	2.00	0.83	0.966	
Ruckle Provincial Park	274	1	2	2	0.83	2	0.83	2	0.83	2	2	1	1	6	2.40	0.66	0.796	
Ruckle Provincial Park	301	2		1	1	1	1	1	1	3	1	1		1	1.50	0.83	0.966	
Ruckle Provincial Park	316	2	2	2	0.83	1	1	1	1	1	2	3	1	2	1.80	0.83	0.881	
Ruckle Provincial Park	327	3	3	3	0.66	3	0.66	3	0.66	3	2	3		1	2.25	0.66	0.660	
Ruckle Provincial Park	328	2		5	5	0.32	5	0.32	5	0.32	3	6	5	5	6	5.00	0.32	0.320
Ruckle Provincial Park	329	1		1	1	1	1	1	1	3	4	5	5	1	3.60	0.49	0.898	
Ruckle Provincial Park	337	2	1	1	1	1	1	1	1	3	1	5		2	2.75	0.66	0.932	
Ruckle Provincial Park	340	3	2	2	0.83	2	0.83	2	0.83	2	6	3	5	2	3.60	0.49	0.762	
Ruckle Provincial Park	342	1	2	2	0.83	2	0.83	2	0.83	3	2	5		2	3.00	0.66	0.796	
Ruckle Provincial Park	343	1	1	1	1	1	1	1	1	3	1	5	2	6	3.40	0.49	0.898	
Ruckle Provincial Park	351	2	2	2	0.83	2	0.83	2	0.83	2	2	3		2	2.25	0.66	0.796	
Ruckle Provincial Park	353	1		3	3	0.66	3	0.66	3	0.66	1	6	3	5	3	3.60	0.49	0.626
Ruckle Provincial Park	362	3		1	1	1	1	1	1	3	4	5		1	3.25	0.49	0.898	
Ruckle Provincial Park	363	2	3	3	0.66	3	0.66	3	0.66	2	1	3	1	1	1.60	0.83	0.694	
Ruckle Provincial Park	365	2	3	3	0.66	3	0.66	3	0.66	3	1	3		3	2.50	0.66	0.660	

Polygon	Polygon	Decile	Step 1			Step 2		Step 3		Step 4						Step 5		
			1a	1b	1 RANK 1	2 RANK 2	3 RANK 3	4a	4b	4c	4d	4e	4 RANK 4	WEIGHTED VALUE				
Ruckle Provincial Park	368	1	2	2	0.83	2	0.83	2	0.83	3	1	3	1	6	2.80	0.66	0.796	
Ruckle Provincial Park	387	3	1	1	1	1	1	1	1	3	4	3	1	6	3.40	0.49	0.898	
Ruckle Provincial Park	388	1	1	1	1	1	1	1	1	3	1	1		1	1.50	0.83	0.966	
Ruckle Provincial Park	394	1	3	3	0.66	3	0.66	3	0.66	3	1	3		6	3.25	0.49	0.626	
Ruckle Provincial Park	395	1	3	3	0.66	3	0.66	3	0.66	3	1	3		6	3.25	0.49	0.626	
Ruckle Provincial Park	399	2	2	2	0.83	2	0.83	2	0.83	1	1	5	1	1	1.80	0.83	0.830	
Ruckle Provincial Park	409	1		1	1	1	1	1	1	3	2	1		1	1.75	0.83	0.966	
Ruckle Provincial Park	411	2	1	1	1	1	1	1	1	3	1	3		2	2.25	0.66	0.932	
Ruckle Provincial Park	423	2	2	2	0.83	2	0.83	2	0.83	2	1	3		1	1.75	0.83	0.830	
Ruckle Provincial Park	424	1		5	5	0.32	5	0.32	5	0.32	2	6	3	5	6	4.40	0.32	0.320
Ruckle Provincial Park	431	1	2	2	0.83	2	0.83	2	0.83	2	4	3		6	3.75	0.49	0.762	
Ruckle Provincial Park	454	1	1	1	1	1	1	1	1	3	1	5		2	2.75	0.66	0.932	
Ruckle Provincial Park	459	2	1	1	1	1	1	1	1	1	1	3	1	6	2.40	0.66	0.932	
Ruckle Provincial Park	463	1	3	3	0.66	3	0.66	3	0.66	3	1	3		6	3.25	0.49	0.626	
Ruckle Provincial Park	466	1	1	1	1	1	1	1	1	3	6	5		6	5.00	0.32	0.864	
Ruckle Provincial Park	480	1	3	3	0.66	3	0.66	3	0.66	2	1	3		6	3.00	0.66	0.660	
Ruckle Provincial Park	481	1	2	2	0.83	2	0.83	2	0.83	3	1	3		6	3.25	0.49	0.762	
Ruckle Provincial Park	505	2	1	1	1	1	1	1	1	2	2	3		6	3.25	0.49	0.898	
Ruckle Provincial Park	530	1	1	1	1	1	1	1	1	2	2	3		6	3.25	0.49	0.898	
Ruckle Provincial Park	537	3		1	1	1	1	1	1	1	1	3		1	1.50	0.83	0.966	
Ruckle Provincial Park	538	2	2	2	0.83	2	0.83	2	0.83	3	1	5		2	2.75	0.66	0.796	
Ruckle Provincial Park	540	2	1	1	1	1	1	1	1	3	1	3		6	3.25	0.49	0.898	
Ruckle Provincial Park	541	2	1	1	1	1	1	1	1	3	6	1	5	6	4.20	0.32	0.864	
Ruckle Provincial Park	1686	1	5	5	0.32	5	0.32	5	0.32	3	1	5		3	3.00	0.66	0.388	
Ruckle Provincial Park	1687	2	3	3	0.66	3	0.66	3	0.66	3	1	3		2	2.25	0.66	0.660	

Polygon	Polygon	Decile	Step 1			Step 2		Step 3		Step 4						Step 5	
			1a	1b	1 RANK 1	2 RANK 2	3 RANK 3	4a	4b	4c	4d	4e	4 RANK 4	WEIGHTED VALUE			
Ruckle Provincial Park	1688	2	3	3	0.66	3	0.66	3	0.66	3	1	3	1	2	2.00	0.83	0.694
Ruckle Provincial Park	1691	1	1	1	1	1	1	1	1	2	1	3	6	3.00	0.66	0.932	
Cusheon Cove Addition	507	1		5	5	0.32	5	0.32	5	0.32	3	6	5	6	5.00	0.32	0.320
Cusheon Cove Addition	517	2	1	1	1	1	1	1	1	2	2	3	6	3.25	0.49	0.898	
Cusheon Cove Addition	522	1	2	2	0.83	2	0.83	2	0.83	3	6	3	6	4.50	0.32	0.728	
Cusheon Cove Addition	525	1	2	2	0.83	2	0.83	2	0.83	2	6	3	2	3.25	0.49	0.762	
Cusheon Cove Addition	532	1	2	2	0.83	2	0.83	2	0.83	3	2	3	6	3.50	0.49	0.762	
Cusheon Cove Addition	533	1	3	3	0.66	3	0.66	3	0.66	3	4	3	2	3.00	0.66	0.660	
Cusheon Cove Addition	554	1	5	5	0.32	5	0.32	5	0.32	3	6	5	2	4.00	0.49	0.354	
Cusheon Cove Addition	565	2	2	2	0.83	2	0.83	2	0.83	2	4	3	2	2.75	0.66	0.796	

Table VII-6. Mount Tuam Ecological Reserve and Adjacent Crown Lands assessment areas.

Polygon	Polygon	Decile	Step 1			Step 2		Step 3		Step 4					Step 5 WEIGHTED VALUE		
			1a	1b	1 RANK 1	2 RANK 2	3 RANK 3	4a	4b	4c	4d	4e	4 RANK 4				
Mount Tuam Ecological Reserve	7	1	1	1	1	1	1	1	1	2	2	1	1	2	1.60	0.83	0.966
Mount Tuam Ecological Reserve	8	1	2	2	0.83	2	0.83	2	0.83	3	1	5		1	2.50	0.66	0.796
Mount Tuam Ecological Reserve	9	2	2	2	0.83	2	0.83	2	0.83	2	1	3		2	2.00	0.83	0.830
Mount Tuam Ecological Reserve	12	2	1	1	1	1	1	1	1	2	1	3		6	3.00	0.66	0.932
Mount Tuam Ecological Reserve	16	3	1	1	1	1	1	1	1	1	1	3	2	2	1.80	0.83	0.966
Mount Tuam Ecological Reserve	18	1	3	3	0.66	3	0.66	3	0.66	3	2	1		2	2.00	0.83	0.694
Mount Tuam Ecological Reserve	19	2	2	2	0.83	2	0.83	2	0.83	1	1	3	1	6	2.40	0.66	0.796
Mount Tuam Ecological Reserve	23	3	2	2	0.83	2	0.83	2	0.83	2	1	3	2	6	2.80	0.66	0.796
Mount Tuam Ecological Reserve	24	1	2	2	0.83	2	0.83	2	0.83	3	2	5		1	2.75	0.66	0.796
Mount Tuam Ecological Reserve	26	1	3	3	0.66	3	0.66	3	0.66	3	1	3		6	3.25	0.49	0.626
Mount Tuam Ecological Reserve	27	2	1	1	1	1	1	1	1	1	1	3	1	1	1.40	0.83	0.966
Mount Tuam Ecological Reserve	28	2	1	1	1	1	1	1	1	3	1	3		6	3.25	0.49	0.898
Mount Tuam Ecological Reserve	31	1	3	3	0.66	3	0.66	3	0.66	3	1	1	2	6	2.60	0.66	0.660
Mount Tuam Ecological Reserve	38	1	2	2	0.83	2	0.83	2	0.83	2	4	3		1	2.50	0.66	0.796
Mount Tuam Ecological Reserve	39	2	2	2	0.83	2	0.83	2	0.83	2	1	3		2	2.00	0.83	0.830
Mount Tuam Ecological Reserve	42	3		1	1	1	1	1	1	2	2	3	2	1	2.00	0.83	0.966
Mount Tuam Ecological Reserve	43	1		1	1	1	1	1	1	3	1	5		2	2.75	0.66	0.932
Mount Tuam Ecological Reserve	48	1	1	1	1	1	1	1	1	2	1	3	1	6	2.60	0.66	0.932
Mount Tuam Ecological Reserve	50	1	2	2	0.83	2	0.83	2	0.83	1	2	1		1	1.25	0.83	0.830
Mount Tuam Ecological Reserve	54	1		1	1	1	1	1	1	1	1	3		1	1.50	0.83	0.966
Mount Tuam Ecological Reserve	55	1	2	2	0.83	2	0.83	2	0.83	2	1	3		2	2.00	0.83	0.830
Mount Tuam Ecological Reserve	59	2	1	1	1	1	1	1	1	3	4	3		6	4.00	0.49	0.898
Mount Tuam Ecological Reserve	60	1	2	2	0.83	2	0.83	2	0.83	2	2	3		6	3.25	0.49	0.762
Mount Tuam Ecological Reserve	65	3		1	1	1	1	1	1	2	1	3		1	1.75	0.83	0.966

Polygon	Polygon	Decile	Step 1			Step 2		Step 3		Step 4					Step 5		
			1a	1b	1 RANK 1	2 RANK 2	3 RANK 3	4a	4b	4c	4d	4e	4 RANK 4	WEIGHTED VALUE			
Mount Tuam Ecological Reserve	67	2	2	2	0.83	2	0.83	2	0.83	1	1	5	2	2.25	0.66	0.796	
Mount Tuam Ecological Reserve	68	2	1	1	1	1	1	1	1	3	1	3	1	2.00	0.83	0.966	
Mount Tuam Ecological Reserve	72	2	1	1	1	1	1	1	1	1	1	1	6	2.25	0.66	0.932	
Mount Tuam Ecological Reserve	74	2	3	3	0.66	3	0.66	3	0.66	3	1	3	1	2.00	0.83	0.694	
Mount Tuam Ecological Reserve	76	2	3	3	0.66	3	0.66	3	0.66	1	6	3	1	2.75	0.66	0.660	
Mount Tuam Ecological Reserve	79	1	3	3	0.66	3	0.66	3	0.66	3	2	5	2	3.00	0.66	0.660	
Mount Tuam Ecological Reserve	80	3	3	3	0.66	3	0.66	3	0.66	2	2	3	1	2.00	0.83	0.694	
Mount Tuam Ecological Reserve	87	3	3	3	0.66	3	0.66	3	0.66	3	2	5	2	3.00	0.66	0.660	
Mount Tuam Ecological Reserve	89	2	1	1	1	1	1	1	1	3	1	3	2	2.25	0.66	0.932	
Mount Tuam Ecological Reserve	95	1	2	2	0.83	2	0.83	2	0.83	3	2	3	2	2.50	0.66	0.796	
Mount Tuam Ecological Reserve	96	1	3	3	0.66	3	0.66	3	0.66	3	4	3	6	4.00	0.49	0.626	
Mount Tuam Ecological Reserve	98	3	2	2	0.83	2	0.83	2	0.83	3	2	5	1	1	2.40	0.66	0.796
Mount Tuam Ecological Reserve	107	1	2	2	0.83	2	0.83	2	0.83	2	2	3	2	2.25	0.66	0.796	
Mount Tuam Ecological Reserve	119	2	3	3	0.66	3	0.66	3	0.66	3	4	3	1	2.75	0.66	0.660	
Mount Tuam Ecological Reserve	1248	2	3	3	0.66	3	0.66	3	0.66	1	4	3	1	2.25	0.66	0.660	
Mount Tuam Ecological Reserve	1253	1	1	1	1	1	1	1	1	3	4	3	2	3.00	0.66	0.932	
Mount Tuam Ecological Reserve	1257	2	3	3	0.66	3	0.66	3	0.66	3	4	3	2	3.00	0.66	0.660	
Mount Tuam Ecological Reserve	1269	2	2	2	0.83	2	0.83	2	0.83	3	6	3	1	3.25	0.49	0.762	
Mount Tuam Ecological Reserve	1661	3		1	1	1	1	1	1	3	1	3	1	1	1.80	0.83	0.966
Mount Tuam Ecological Reserve	1662	2	2	2	0.83	2	0.83	2	0.83	3	1	3	1	2.00	0.83	0.830	
Mount Tuam Ecological Reserve	1741	1	2	2	0.83	2	0.83	2	0.83	3	2	5	1	2	2.60	0.66	0.796
Mount Tuam Ecological Reserve	1744	1	2	2	0.83	2	0.83	2	0.83	3	1	3	2	2.25	0.66	0.796	
Mount Tuam Ecological Reserve	1745	1		1	1	1	1	1	1	3	1	3	1	2.00	0.83	0.966	
Mount Tuam Ecological Reserve	1746	2		1	1	1	1	1	1	2	1	3	1	1.75	0.83	0.966	
Mount Tuam Ecological Reserve	1747	1		1	1	1	1	1	1	3	1	3	1	2.00	0.83	0.966	

Table VII-7. Adjacent Crown Lands assessment areas to Mount Tuam Ecological Reserve

Polygon	Polygon	Decile	Step 1			Step 2		Step 3		Step 4						Step 5 WEIGHTED VALUE	
			1a	1b	1 RANK 1	2 RANK 2	3 RANK 3	4a	4b	4c	4d	4e	4 RANK 4				
Crown Lands	4	1	2	2	0.83	2	0.83	2	0.83	3	1	3	1	1	1.80	0.83	0.830
Crown Lands	5	3	1	1	1	1	1	1	1	2	1	3		2	2.00	0.83	0.966
Crown Lands	6	2	2	2	0.83	2	0.83	2	0.83	1	1	3		6	2.75	0.66	0.796
Crown Lands	10	2	1	1	1	1	1	1	1	1	2	3		6	3.00	0.66	0.932
Crown Lands	11	1	1	1	1	1	1	1	1	2	1	1		2	1.50	0.83	0.966
Crown Lands	15	2		1	1	1	1	1	1	1	1	3	2	1	1.60	0.83	0.966
Crown Lands	17	2	2	2	0.83	2	0.83	2	0.83	1	1	3	1	2	1.60	0.83	0.830
Crown Lands	20	1	2	2	0.83	2	0.83	2	0.83	3	2	3		2	2.50	0.66	0.796
Crown Lands	1759	3	3	3	0.66	3	0.66	3	0.66	3	1	5		1	2.50	0.66	0.660

APPENDIX XII. TEM MAP LEGEND FOR SALT SPRING ISLAND PARKS AND ECOLOGICAL RESERVES

TERRESTRIAL ECOSYSTEM MAPPING OF BC PARKS AND ECOLOGICAL RESERVES - SALT SPRING ISLAND LOCAL TRUST AREA

Map sheets 92B/073, 074, 083, 092, 093, 92G/002

(Scale Mapped at 1:16 500) October 2007

INTRODUCTION				
<p>This project synthesizes results of bioterrain and terrestrial ecosystem mapping of the parcels identified by BC Parks on Salt Spring Island, namely Mount Erskine Provincial Park, Mount Tuam Ecological Reserve, Burgoyne Bay Provincial Park and Addition, Mount Maxwell Park and Mount Maxwell Ecological Reserve, and Ruckle and Beaver Point Provincial Parks and Cusheon Cove Addition.</p> <p>Digital maps will aid interpretation for Parks planning and management; collection of baseline ecosystem data; identified wildlife habitat capability and suitability; and mapping disturbed areas. A seamless database of polygon attributes and the associated bioterrain and ecosystem data, as well as other features and parameters of interest accompanies this legend. Mapping was completed following the methods outlined in Standard for Terrestrial Ecosystem Mapping in British Columbia. Fieldwork was completed in spring and summer of 2007 at survey intensity level 3. All codes and modifiers follow RISC standards¹, except detailed wetland codes that follow Mackenzie and Moran (2004). Terrain codes use the format of Howes and Kenk (1997).</p>				
Ecosections SGI: Southern Gulf Islands		Biogeoclimatic Units: CDFmm: Coastal Douglas-Fir zone, moist maritime subzone CWHxml: Coastal Western Hemlock zone, very dry maritime subzone, eastern variant		
ECOSYSTEM UNITS MAPPED IN THE CDFmm (Bold = Mapped Within BC Parks and Ecological Reserves)				
Site Code	Description	Site Series	Assumed Modifiers	Soil Moisture Regime
AS	Trembling aspen - Slough sedge	00	j, m	mesic - subhygric
CS	Western redcedar - Slough sedge	14	d, j, m	subhydric
CW	Black cottonwood - Willow	09	a, c, d, j	subhygric - hygric
DA	Douglas-fir - Shore pine - Arbutus	02	d, j, m, r	xeric
DG	Douglas-fir - Grand fir - Oregon grape	04	d, j, m	subxeric - mesic
DO	Douglas-fir - Oniongrass	03	d, m, r	xeric
DS	Douglas-fir - Salal	01	d, j, m	subxeric - mesic
Em02	Glasswort - Sea-milkwort estuary			
FC	Fescue - Camas	00	j, m, s	subxeric
GO	Garry oak - Oceanspray	00	j, m, r	xeric - subxeric
HL	Hardhack - Labrador tea	00	d, j, p	subhydric
OM	Garry oak - moss	00	j, v	xeric
OR	Oceanspray - Rose	00	m, s	mesic
QB	Garry oak-Brome/mixed grasses	00	j, m, r	xeric - subxeric
RC	Western redcedar - Skunk cabbage	11	d, j, m	subhydric
RF	Western redcedar - Grand fir - Foamflower	06	d, j, m	subhygric - hygric
RK	Western redcedar - Douglas-fir - Oregon beaked moss	05	d, j, m	subhygric - hygric
RP	Western redcedar - Indian-plum	13	d, j, m	hygric
RS	Western redcedar - Snowberry	07	a, d, j, m	subhygric - hygric
RV	Western redcedar - Vanilla-leaf	12	d, j, m	subhygric
SC	Cladina - Wallace's selaginella	00	j, m, r, v	subxeric
SL	Sedge - Western lilaeopsis	00	d, j, m	hygric
SS	Spirea - Sedge wetland	00	d, j, p	hygric
Wf53	Slender sedge - White beak-rush			
Ws50	Spirea-Hardhack - Sitka sedge			

ECOSYSTEM UNITS MAPPED IN THE CWHxm (Bold = Mapped Within BC Parks and Ecological Reserves)				
Site Code	Description	Site Series	Assumed Modifiers	Soil Moisture Regime
AM	Arbutus - Hairy manzanita	00	j, r, s	xeric
CS	Western redcedar - Slough sedge	15		subhydryc
CW	Black cottonwood - Willow (F150-Sitka willow-False lily-of-the-valley)	10		subhydryc-hygric
DC	Douglas-fir - Shore pine-Cladina	02	d, j, m	very xeric
DF	Douglas-fir - Sword fern	04	d, j, m	xeric - subxeric
DS	Douglas-fir - Western hemlock - Salal	03	d, j, m	xeric - subxeric
FC	Fescue-Camas	00	j, m, s	subxeric
HD	Western hemlock - Western redcedar - Deer fern	06	d, j, m	subhydryc - hygric
HK	Douglas-fir - Western hemlock - Oregon beaked moss	01	d, j, m	submesic - mesic
HL	Hardhack - Labrador tea	00	d, j, p	subhydryc
RB	Western redcedar - Salmonberry	13	d, j, m	subhydryc
RC	Western redcedar - Sitka spruce - Skunk cabbage (Ws53-Cw-Sword fern - Skunk cabbage)	12	d, j, m	subhydryc
RF	Western redcedar - Grand fir - Foamflower	07	d, j, m	subhydryc - hygric
RS	Western redcedar - Swordfern	05	d, j, m	submesic - mesic
RT	Western redcedar - Black twinberry	14	d, j, m	hygric
SC	Cladina - Wallace's selaginella	00	j, m, r, v	very xeric
SS	Sitka spruce - Salmonberry	08	d, j, m	subhydryc - hygric
SW	Spirea - Sedge wetland	00	d, j, p	subhydryc
Wb50	Labrador tea - Bog-laurel - Peat-moss			subhydryc
Ws50	Spirea - Sitka sedge swamp			subhydryc
ANTHROPOGENIC AND SPARSELY VEGETATED UNITS (Bold = Mapped Within BC Parks and Ecological Reserves)				
Site Code	Description	Site Code	Description	
BE	beach	LA	lake	
CF	cultivated field	OW	open water (<2m deep)	
CL	cliff	PD	pond	
CO	cultivated orchard	RO	rock outcrop	
ES	exposed soil	RW	rural developed	
GC	golf course	RZ	road surface	
GP	gravel pit	UR	urban	
SITE MODIFIERS (Atypical Conditions) (Bold = Mapped Within BC Parks and Ecological Reserves)				
Code	Topography			
a	active floodplain: level or very gently sloping area bordering a river that has been formed by river erosion and deposition, with evidence of active sedimentation and deposition			
g	gullying: occurs within a gully, or with gullying throughout the delineated area			
h	hummocky terrain: indicated by the terrain surface expression			
j	gentle slope: < 35% in the CWH and CDF zones			
k	cool aspect: occurs on aspects 285°–135°, on moderately steep slopes (35%–100% in the CWH and CDF)			
n	fan ¹ : occurs on a fluvial fan or on a colluvial fan or cone			
q	very steep cool aspect–very steep slopes (< 100%) with aspects 285°–135°			
r	ridge: occurs throughout an area of ridged terrain, or on a ridge crest			
w	warm aspect: 135°–285°, on moderately steep slopes (35%–100% slope in the CWH and CDF zones)			
z	very steep warm aspect –slopes > 100% on aspects 135°–285°			
Code	Moisture			
x	drier than typical			
y	moister than typical			
Code	Soil			
d	deep soil: >100 cm to bedrock			
m	medium-textured soils: sandy loam, loam and sandy clay loam with > 70% coarse fragment volume; silt loam and silt with > 20% coarse fragment volume; and clay, silty clay, silty clay loam, clay loam, sandy clay, and heavy clay with > 35% coarse fragment volume			
p	peaty: on deep organics or a peaty surface (15–60 cm) over mineral materials			
s	shallow soils: 20–100 cm to bedrock			
v	very shallow soils: < 20 cm to bedrock			

STRUCTURAL STAGE & STRUCTURAL STAGE MODIFIERS			
Code	Structural Stage		
1	Sparse/bryoid bryophytes and lichens dominant, may reflect recent disturbance; Sparse (1a) bare rock or ground (<10% vegetation cover) / Bryoid (1b) bryophytes and lichens dominant		
2	Herb some invading or residual shrubs and trees may be present, may reflect recent disturbance; Forb-dominated (2a) includes non-graminoid herbs and ferns; Graminoid-dominated (2b) grasses, sedges, rushes, reeds; Aquatic herbs (2c) dominate the site with standing water or submerged		
3	Shrub Early successional stage or maintained by environmental conditions or disturbance		
	Low shrub (3a) < 2 m tall / Tall shrub (3b) 2–10 m tall		
4	Pole/Sapling Trees > 10 m tall, often densely stocked, no vertical canopy structure, typically < 40 years since disturbance		
5	Young Forest Self-thinning and canopy differentiation initiated, typically 40–80 years since disturbance		
6	Mature Forest Mature tree canopy, typically 80–250 years since disturbance		
7	Old Forest Structurally complex stands comprised mainly of shade-tolerant and regenerating tree species; snags and coarse woody debris and patchy understories, typically > 250 years since disturbance.		
Code	Stand Composition Modifiers		
B	broadleaf (>75% of stand)		
C	conifer (>75% of stand)		
M	mixed (neither comprises >75% of stand)		
DISTURBANCE CLASSES AND MODIFIERS			
B	Biotic Disturbances		
d	<ul style="list-style-type: none"> ▪ Domestic grazing/browsing 		
L	Forest Harvesting		
a	<ul style="list-style-type: none"> ▪ patch cut system ⇒ with reserves 	e	<ul style="list-style-type: none"> ▪ selection system ⇒ group selection
c	<ul style="list-style-type: none"> ▪ clearcut system ⇒ with reserves (patch retention) 	gr	<ul style="list-style-type: none"> ⇒ single tree
d	<ul style="list-style-type: none"> ▪ seed tree system ⇒ uniform ⇒ grouped 	si	<ul style="list-style-type: none"> ⇒ strip
		st	<ul style="list-style-type: none"> ▪ land clearing
		l	
DATA SOURCES			
This mapping project is based on 1:16 500 colour stereo aerial photography taken by McElhanney in 2005. Photos were purchased by The Islands Trust Fund. Base map is from Terrain Resource Inventory Mapping (TRIM) and provided by the Integrated Land Management Bureau (ILMB). A total of 176 plots (15 Full, 61 Ground and 100 Visual inspections) were completed within park polygons. Many of the larger polygons had multiple plots completed within them; therefore 119 of the total 293 polygons within parks were sampled.			
CREDITS			
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Funding:	Integrated Land Management Bureau, The Islands Trust Fund, Ministry of Environment, BC Parks		
LITERATURE CITED			
Resources Inventory Committee [RIC]. 1998. Standard for terrestrial ecosystem mapping in British Columbia. Ecosystems Working Group, Terrestrial Ecosystems Task Force, Resources Inventory Committee. Vancouver, B.C. 100 pp.			

ADDITIONAL INFORMATION MAPPED FOR BC PARKS AS PART OF TEM:

Mapped terrain texture modifiers

Code	Texture	Description
a	blocky	angular fragments >265 mm
c	clay	particles <0.0002 mm
d	mixed fragments	mixture of angular and rounded fragments >2 mm
s	sand	particles 0.0625-2 mm
x	angular fragments	angular fragments 2-265 mm
z	silt	particles 0.002-0.0625 mm

Terrain units of Salt Spring Island Parks

Code	Surficial Material	Assumed activity ^a	Code	Surficial Material	Assumed activity ^a
A	Anthropogenic	A	O	Organic	A
C	Colluvium	A	R	Bedrock	n/a
F	Fluvial	I	W	Marine	I
F ^G	Glaciofluvial	I	W ^G	Glaciomarine	I
M	Morainal (Till)	I			

^a A=active, I=inactive

Mapped terrain surface expression modifiers

Code	Expression	Description
a	moderate slope	slope 27-49%
b	blanket	surface material >1 m thick
f	fan	slope <26%
h	hummock	rises and hollows with slope >26%
j	gentle slope	slope 6-26%
k	moderately steep slope	slope 50-70%
p	plain	slope 0-5%
r	ridge	elongated rises with slopes >26%
s	steep slope	slope >70%
u	undulating	rises and hollows with slope <26%
v	veneer	surface material >1 m thick
w	mantle of variable thickness	surface material varies in thickness
x	thin veneer	surface material <20 cm thick

Mapped terrain geomorphological processes

Group	Code	Process	Activity	Description
Erosional	V	gully erosion	A	surface formation of parallel long narrow ravines
	W	washing	A	modification by waves or running water
Mass movement	R	rapid mass movement	A	rapid downslope falling, rolling, sliding or flowing surficial material or bedrock components
Deglacial	E	channeled by meltwater	I	channel erosion or formation by glacial meltwater
Hydrologic	L	surface seepage	A	abundant surface or seasonal seepage

^a A=active, I=inactive

Mapped terrain geomorphological process subclasses and subtypes

Group	Code	Process	Code	Process	Code	Process
Mass movement	"	Initiation zone	d	debris flow	u	surficial material slump

Terrain drainage classes

Code	Description	Code	Description
x	extremely rapid	i	imperfect
r	rapid	p	poor
w	well	v	very poor
m	moderately well		

Data sources

Aerial photos, 2005, 1:16 500, colour

Flight line	Roll	Photos
91	RC29	205-206
92	RC29	195-198
93	RC29	190-194
94	RC29	173-178
95	RC29	166-172
96	RC29	140-147
85	RC30	6-14
84	RC30	15-24
83	RC30	25-33
82	RC30	34-44
81	RC30	45-56
80	RC30	58-67
79	RC30	68-74

Citation

Madrone Environmental Services Ltd. 2007. Terrestrial Ecosystem Mapping of Provincial Parks on Salt Spring Island, (Mapsheets BGCS 092B073, 092B074, 092B083); 1:20 000. Contract report to BC Parks. Duncan, B.C.