



Mount Maxwell Ecological Reserve Management Plan

October 2012



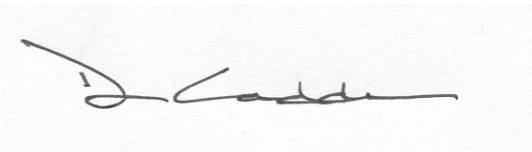
BC Parks

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This document replaces the
Mount Maxwell Ecological Reserve
Purpose Statement (2004).

Mount Maxwell Ecological Reserve Management Plan

Approved by:



Don Cadden
Regional Director, West Coast Region
BC Parks

June 18, 2012

Date



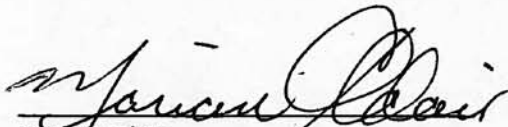
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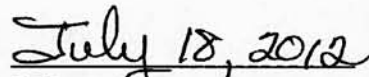
October 1, 2012

Date

Acceptance and Approval of the Management Plan by Partner

Pursuant to the Lease Agreements between The Nature Trust of British Columbia and The Province, the lease partner accepts and approves the Mount Maxwell Ecological Reserve Management Plan as signed below:


Marian Adair
Acting CEO/Habitat Ecologist
The Nature Trust of British Columbia


Date

Acknowledgements

The Mount Maxwell Ecological Reserve Management Plan was a joint initiative between BC Parks and The Nature Trust of British Columbia (B.C.). Peggy Burfield coordinated the management planning process with the assistance of the management planning team of Sharon Erickson, Brett Hudson, Jaime Hilbert, Joe Benning, Ron Quilter, and Andy Macdonald from BC Parks. Marlene Caskey from the Ministry of Forests, Lands and Natural Resource Operations and Jim Hope, Tom Reid, and Marian Adair from The Nature Trust of B.C. also assisted. All members of the management planning team contributed in the development of this management plan and assisted in the community consultation process.

Terry McIntosh of Biospherics Environmental Incorporated prepared a draft Mount Maxwell Ecological Reserve Management Plan for The Nature Trust of B.C. Harry Parsons and Shannon Macey-Carroll of Bufo Incorporated assisted in the stakeholder and community consultation, then drafted and revised the draft management plan based on direction from the management planning team. Peggy Burfield wrote the final version of the management plan.

Paul Linton, the Salt Spring Island Ecological Reserve Warden, provided his knowledge of, and familiarity with, the area in the development of the management plan as well as led several field trips to the ecological reserve with the management planning team and Bufo Incorporated staff.

Numerous other people provided input and information for this management plan as members of the Salt Spring Island Management Planning Project Technical Advisory Committee. The advisory committee members contributed their local knowledge and expertise. In addition, local and regional stakeholders and community members provided valuable input and comments in the development of this management plan.

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1.0 Introduction

1.1 Management Plan Purpose

The purpose of this management plan is to provide strategic management direction for Mount Maxwell Ecological Reserve in keeping with the *Ecological Reserve Act*, and lease agreements between BC Parks and The Nature Trust of B.C. (TNT).

The primary objectives of this management plan are to:

- outline the role the ecological reserve plays in British Columbia’s protected areas system;
- identify management objectives and strategies for the protection of natural and cultural values; and
- identify the role of First Nations, the local community and others in implementing the management plan.

The Mount Maxwell Ecological Reserve Management Plan uses background information collected by BC Parks and information contained in a draft management plan that was prepared for TNT in 2005.



Figure 1: View from Mount Maxwell Ecological Reserve

1.2 Planning Area

Mount Maxwell Ecological Reserve is located on the west side of Salt Spring Island in the southern Gulf Islands off the east coast of Vancouver Island, about half way between Nanaimo and Victoria. The ecological reserve contains a variety of features including Garry oak meadows, moss covered rocky outcrops and bluffs, species-at-risk, and ecosystems-at-risk.

The ecological reserve is one of a group of provincial parks, provincial ecological reserves, regional parks, and private protected areas on Salt Spring Island. These protected areas include Ruckle Provincial Park, Mount Tuam Ecological Reserve, Mill Farm Regional Park Reserve, Burgoyne Bay Provincial Park, Mount Maxwell Provincial Park, Manzanita Ridge Nature Reserve, Mount Erskine Provincial Park, and Lower Mount Erskine Nature Reserve (Figure 2).

The ecological reserve is adjacent and connected to Mount Maxwell and Burgoyne Bay provincial parks, and is a part of a contiguous protected area network that, along with Capital Regional District park reserves, forms one of the largest blocks of protected areas in the Gulf Islands. These protected areas protect over 1,400 hectares on south-western Salt Spring Island, including one of Canada's largest Garry oak meadows. These protected areas have high conservation values, as they contribute to the protection of the under-represented Coastal Douglas-fir biogeoclimatic zone.

Salt Spring Island is home to one of Canada's largest Garry oak ecosystems, one of the most threatened ecosystems in the country. In Canada, Garry oak ecosystems are found only on southern Vancouver Island, the Gulf Islands, and in two isolated locations in the Fraser River Valley. The ecological reserve conserves stands of Garry oak and associated vegetation that are representative of this ecosystem.

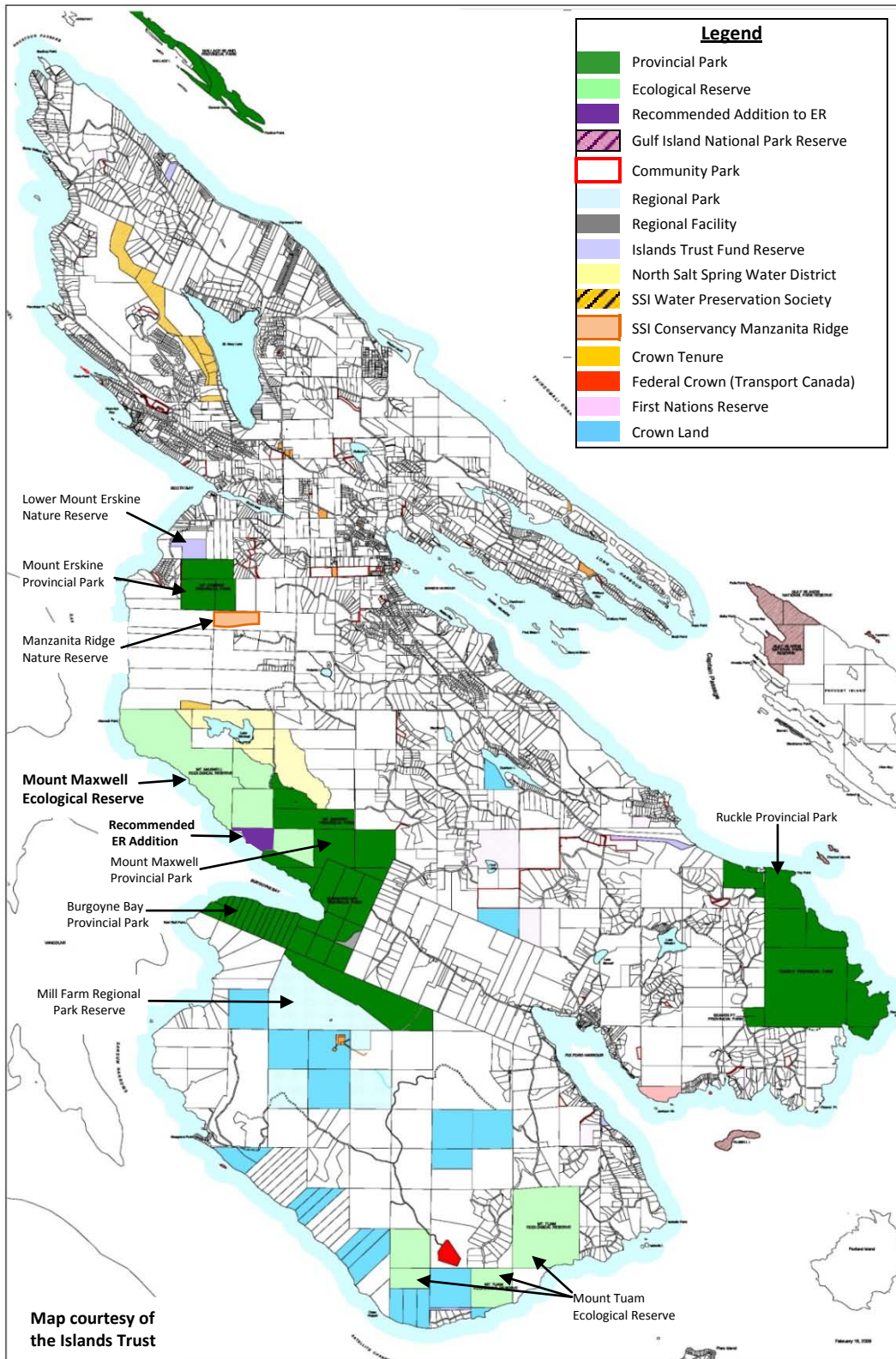


Figure 2: Salt Spring Island Protected Areas Context Map

1.3 Legislative Framework

In 1972, Mount Maxwell Ecological Reserve, comprising 65 hectares on the north side of Burgoyne Bay, on southwest Salt Spring Island, was established.

In 2001, TNT purchased several parcels of land adjacent to the ecological reserve for the protection of the Garry oak meadows, associated ecosystems-at-risk, and species-at-risk. These lands were leased to the Province for a 99-year term commencing on July 11, 2001. In 2004, the TNT lands and an additional 45 hectares of land purchased by the Province were added to the ecological reserve, increasing its size to 390 hectares.

On December 15, 2011, TNT, with funding support from the Natural Area Conservation Program, in partnership with the Province, completed the acquisition of the last remaining parcel of private land along the shores of Burgoyne Bay (Figure 3). This 22.3-hectare waterfront property has been leased to the Province and is recommended to be added to Mount Maxwell Ecological Reserve.

Once the recommended addition is included in the ecological reserve, the original 65 hectare ecological reserve; the land added to the ecological reserve in 2004 including TNT lands leased to the Province in 2001; and the newly acquired 22.3 hectares of land, will be managed under the *Ecological Reserve Act* and this management plan

The purpose of the *Ecological Reserve Act* is to reserve Crown land for ecological purposes, including the following areas:

- areas suitable for scientific research and educational purposes associated with studies in productivity and other aspects of the natural environment;
- areas that are representative examples of natural ecosystems in British Columbia;
- areas that serve as examples of ecosystems that have been modified by human beings and offer an opportunity to study the recovery of the natural ecosystem from modification;
- areas where rare or endangered native plants and animals in their natural habitat may be preserved;
- areas that contain unique and rare examples of botanical, zoological, or geological phenomena.

Although recreational use in the ecological reserve is not encouraged by BC Parks, non-consumptive and non-mechanized recreation are permitted.

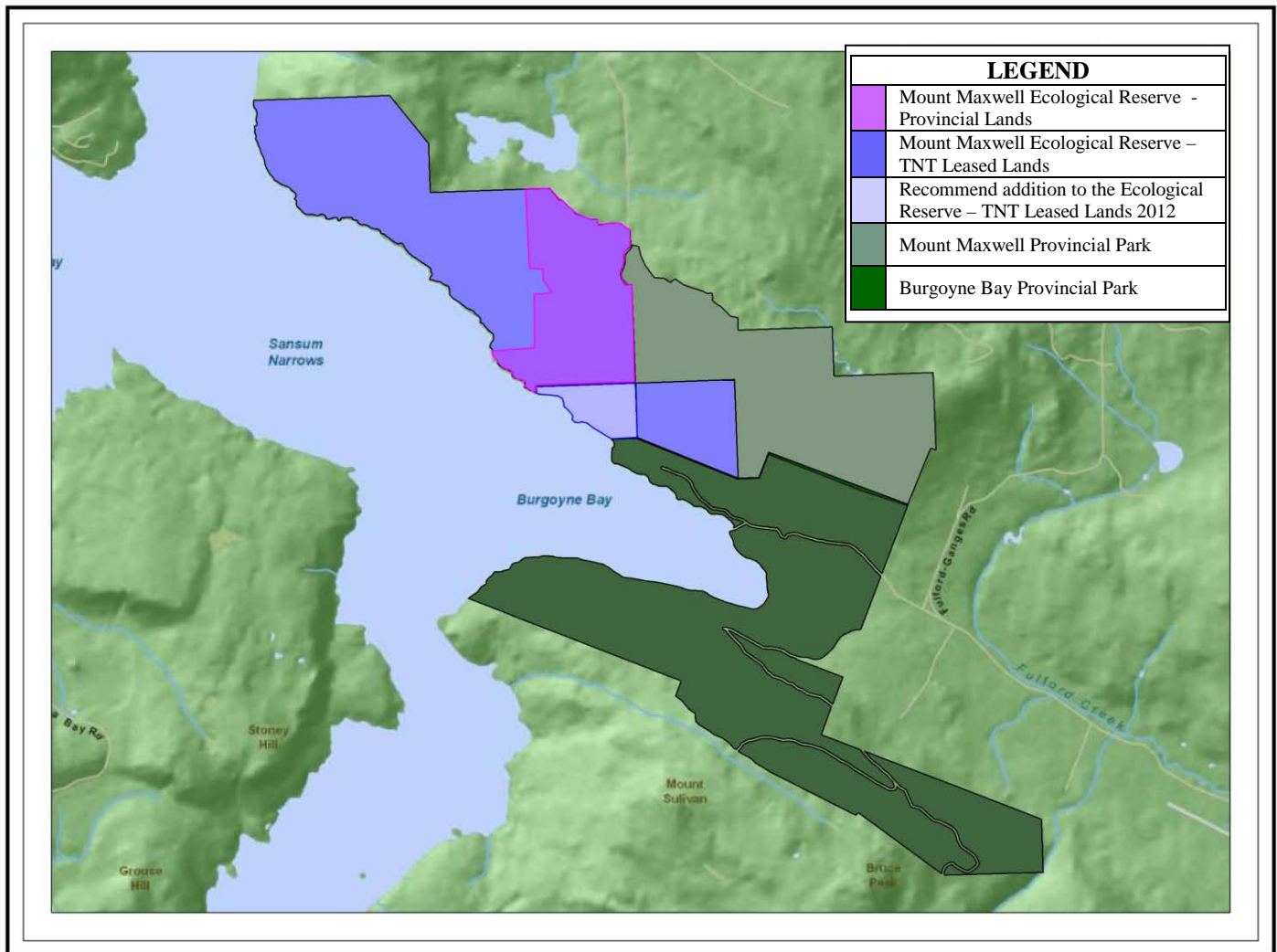


Figure 3: Mount Maxwell Ecological Reserve

1.4 Management Agreement

TNT lands purchased in 2001 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 targeted forest ecosystems on private lands that have not been adequately represented in private and public conservation initiatives. Forest Renewal BC and TNT funded the acquisition 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.

TNT acquired the final 22.3 hectares of private land along the shores of Burgoyne Bay, in December 2011, with funding support from the federal government through the Natural Area Conservation Program that was facilitated by the Nature Conservancy of Canada. TNT has a Land Holding Agreement with the Nature Conservancy of Canada.

The Province (Ministry of Environment) and TNT have two lease agreements for these lands. Under the terms of the lease agreements, BC Parks has committed to a number of actions in the management of these lands. Some of these commitments include:

- Approval by the TNT of a management plan setting out the manner in which each part of the land shall be managed, protected, and monitored to achieve the purpose of long-term conservation;
- The management plan must address the protection of the Garry oak woodland habitat and other species of concern on the land and the enhancement of biodiversity preservation consistent with the objectives of BC Parks.

BC Parks must:

- Conserve and protect the overall biodiversity and ecological values of the property;
- Manage the ecological reserve to conserve and enhance critical ecological values;
- Define and manage access and weed control on site;
- Repair and keep up the fences and other protective structures installed on the property;
- Not cut down any trees or other vegetation on the land except in conformity with the leases and the approved management plan and except as may be required to eliminate immediate hazards to public health and safety;

There are no land or resource tenures in Mount Maxwell Ecological Reserve.

1.5 Relationship with First Nations

The Province and First Nations' governments are working towards a new relationship based on respect, recognition, and accommodation of aboriginal title and rights. In addition, the Government of Canada and the Province are in treaty negotiations with the Hul'qumi'num Treaty Group, whose member nations have interests in the management of Mount Maxwell Ecological Reserve. As such, any future formal agreement reached with First Nations with respect to the management of the ecological reserve may require changes to this management plan.

1.6 Relationship with Communities, Agencies and Stakeholders

In addition to BC Parks, several other agencies have interests in and around the ecological reserve including:

- BC Hydro has a major transmission line and right-of-way bordering the north end of the ecological reserve.
- The BC ministry responsible for archaeology has interest in the cultural heritage and archaeological sites in Mount Maxwell Ecological Reserve.
- The BC ministry responsible for transportation has an interest in Mount Maxwell Road, which provides access to the edge of Mount Maxwell Ecological Reserve.
- The BC ministry responsible for wildfire management has interest in wildfire management and response on Salt Spring Island.
- Capital Regional District Parks Department and the Capital Regional District Salt Spring Island Recreation Commission manage a number of community and regional parks and reserves on Salt Spring Island, and have developed a regional park strategy.
- Fisheries and Oceans Canada has an interest in Burgoyne Bay and foreshore areas.
- Ganges Fire/Rescue Department has an interest regarding fire management and response on Salt Spring Island as well as public safety.
- Islands Trust is the managing government body responsible for land use planning, policy development, and the overall protection of the Gulf Islands, including Salt Spring Island.
- The North Salt Spring Waterworks is responsible for the land adjacent to the ecological reserve, which contains Maxwell Lake, the source of drinking water for much of Ganges and the surrounding areas.
- The Land Conservancy of B.C. has an interest in the protection of sensitive ecosystems and cultural areas, and along with the Salt Spring Island Conservancy, holds a conservation covenant on 106 hectares of land adjacent to the Mount Maxwell Lake watershed.
- The Nature Conservancy of Canada has an interest in the protection of sensitive ecosystems and cultural areas in B.C. They assisted with the purchase of the 22.3-hectare addition to the ecological reserve by facilitating funding support from the federal government through the Natural Area Conservation Program. They also hold a Land Holding Agreement with TNT.
- TNT owns 273.7 hectares of land within Mount Maxwell Ecological Reserve, which is leased to the Province, and an additional 22.3 hectares of land that is also leased to the Province that is recommended to be added to Mount Maxwell Ecological Reserve.

Several other key stakeholder groups have interests in and around the ecological reserve including:

- Ecological Reserve Wardens have an interest in the protection and management of B.C.'s ecological reserves. They contribute their knowledge of natural history, enthusiasm for conservation and their time and effort to the protection of ecological reserves. The ecological reserves on Salt Spring Island have an ecological reserve warden.
- Friends of Ecological Reserves have an interest in the management of provincial ecological reserves.
- Friends of Saltspring Parks Society (FOSP) have an interest in ensuring the protection of natural values and the continuance of low impact recreational activities in the protected areas on Salt Spring Island.
- The Garry Oak Ecosystems Recovery Team was established to coordinate efforts to protect and restore endangered Garry oak and associated ecosystems and the species at risk that inhabit them.
- The Garry Oak Meadow Preservation Society has an interest in saving the Garry oaks and their ecosystems. The society organizes activities that protect Garry oaks and their habitats.
- Adjacent private landowners have interests in any impacts from the ecological reserve on their property and their impacts on the ecological reserve.
- Salt Spring Island Conservancy has an interest in preserving natural habitats on Salt Spring Island and the surrounding waters. It, along with The Land Conservancy of B.C., holds a conservation covenant on 106 hectares of land adjacent to the Mount Maxwell Lake watershed.
- Salt Spring Island Stream and Salmon Enhancement Society has an interest in the protection of fish bearing streams, riparian areas and the removal of invasive species.
- Salt Spring Island Trail and Nature Club has an interest in the availability of walking and hiking trails on Salt Spring Island.

1.7 Adjacent Patterns of Land Use

Mount Maxwell Ecological Reserve is surrounded by ocean to the southwest and elsewhere by land owned by the Salt Spring Island Water Preservation Society, private property, and two provincial parks (Figures 2 and 3). Existing uses around the ecological reserve include boating and moorage in Burgoyne Bay and Sansum Narrows to the south and west. Burgoyne Bay Provincial Park borders the ecological reserve to the south and east. To the north, the ecological reserve borders Mount Maxwell Road, Mount Maxwell Provincial Park, watershed land, and private lands. The Texada Land Corporation holds a forest license for forest lands to the northwest. There are also several adjacent water lot leases in Burgoyne Bay.

1.8 Access Management

There is no designated public access into the ecological reserve; however, the Mount Maxwell Road provides access up to the northern boundary of the ecological reserve. In addition, a few unsanctioned trails lead into the ecological reserve from adjacent lands. A number of access points have been used for hiking and observational purposes, as the views from the bluffs in the ecological reserve are highly valued by visitors. An informal viewing site exists just inside the ecological reserve's northeast boundary adjacent to Mount Maxwell Road, and portions of trails originating in Mount Maxwell Provincial Park traverse the ecological reserve.

Although the shoreline of Burgoyne Bay is typically rocky, the ecological reserve contains a few pocket beaches that are frequented by boaters, in particular kayakers, that use various open outcrop areas at the base of the ecological reserve along Burgoyne Bay. At least two low bluffs in the ecological reserve along Burgoyne Bay have been used as boating stops, including a site referred to as Maxwell Beach. These small boat access points show evidence of both day-use and unauthorized camping.

1.9 The Planning Process

This management plan was developed between the summer of 2006 and summer of 2012. It was developed concurrently with the management plans for the five other provincial protected areas on Salt Spring Island: Burgoyne Bay, Mount Maxwell, Mount Erskine, and Ruckle provincial parks and Mount Tuam Ecological Reserve. Each provincial protected area on Salt Spring Island has its own special features, values, and roles; however, they all share common characteristics and management needs. A combined management planning process provided BC Parks with the benefit of effectively understanding Salt Spring Island's unique characteristics and efficiently provided opportunities for public involvement in the management planning process.

In the winter of 2007, a technical advisory committee was formed to assist BC Parks with the Salt Spring Island Protected Areas Management Planning Project. The technical advisory committee included representatives from the Salt Spring Island Conservancy, The Nature Conservancy of Canada, BC Parks, the Islands Trust, the Capital Regional District, The Land Conservancy of B.C., The Nature Trust of B.C., the Friends of Saltspring Parks Society and the planning consultants working on the project. To assist BC Parks in preparing the management planning documents, a series of technical advisory committee meetings were held.

A series of meetings, focus group discussions, and field trips with partners, stakeholders, and individuals expressing an interest in Salt Spring Island's provincial parks and ecological reserves and the BC Parks' management planning process occurred during the summer and fall of 2007.

Open houses and public meetings were held on Salt Spring Island in July 2007 and January 2008. In addition, information on the protected areas was posted on the BC Parks website. The information gathered from the public consultation was used in the development of the draft management plans. Appendix I provides a summary of what the public identified as Mount Maxwell Ecological Reserve's key values, activities, and management issues.

In the summer of 2009, the draft Mount Maxwell Ecological Reserve Management Plan, along with the five other Salt Spring Island protected area draft management plans, was posted on the BC Parks website for public review and comment. In addition, an open house and a public forum to discuss the draft management plans and provide comments took place on Salt Spring Island in October 2009. The information from this stage of the public process was considered in the development of the final management plans.

In summer 2012, following the acquisition of the 22.3 hectares of private property, the Mount Maxwell Ecological Reserve Management Plan was finalized. This involved input from the Nature Conservancy of Canada and review and acceptance by TNT.

The ecological reserve is within the traditional territory of the Chemainus First Nation, Cowichan Tribes, Halalt First Nation, Lake Cowichan First Nation, Lyackson First Nation, and Penelakut First Nation (all members of the Hul'qumi'num Treaty Group) and the Tsawwassen First Nation. BC Parks invited all the First Nations to participate in the Salt Spring Island management planning process.



Figure 4: Salt Spring Island Management Planning Project Open House

2.0 Values and Roles of the Ecological Reserve

2.1 Significance in the Parks and Protected Areas System

Mount Maxwell Ecological Reserve is significant to B.C.'s parks and protected areas system. The role of this ecological reserve is to:

- Protect 372.5 hectares of the red-listed Coastal Douglas-fir moist maritime biogeoclimatic subzone (CDFmm) equalling 3.8% of the CDFmm protected provincially;
- Protect critical habitat for four federally protected species-at-risk;
- Protect a series of coastal ecosystems, which have very low representation in the system, including nine red-listed CDFmm and two red-listed CWHxm1 ecosystems;
- Provide a critical natural benchmark for monitoring these ecosystems, including the impacts of climate change; and
- Provide opportunities for researchers, scholars, and students for on-site data collection.

The group of provincial parks and protected areas on Salt Spring Island is important for a number of reasons, including:

- Protection of globally significant examples of northern Garry oak ecosystems – particularly in terms of having the extensive areas necessary to support a diversity of landscape, successional, and natural processes;
- Protection of 17.2% of the provincially protected, red-listed Coastal Douglas-fir moist maritime biogeoclimatic subzone, twelve red-listed ecosystems, and habitat for several species-at-risk;
- Protection for, and opportunities for interpretation of, the island's cultural values, including First Nations and farming history;
- Protection for some of the most extensive and significant First Nations cultural landscapes, which are of increasing interest for cultural research, landscape conservation, and ecosystem restoration;
- The provincial parks provide low-impact recreational opportunities for Salt Spring Island residents and visitors; and
- These protected areas provide important opportunities for ecosystem protection and public recreation in a regional context in which most land is privately owned.

2.2 Natural Heritage

The information in this section comes primarily from the *Salt Spring Island Parks and Ecological Reserves – Terrestrial Ecosystem Mapping and Conservation Assessment* completed by Madrone Environmental Services in 2007 and the *Draft Management Plan for the Mt. Maxwell Ecological Reserve* completed by Biospherics Environmental Incorporated in 2005. Definitions for technical terms are summarized in the glossary in Section 6.0.

Ecosystem Representation

As a group, the provincial protected areas on Salt Spring Island, including Mount Maxwell Ecological Reserve, play an important role in protecting significant representative ecosystems in the Southern Gulf Islands Ecoregion. Their representation of key biogeoclimatic subzones in the Coastal Douglas-fir moist maritime (CDFmm) and Coastal Western Hemlock very dry maritime subzone, eastern variant (CWHxm1) is very significant. The provincial protected areas on Salt Spring Island protect 1,678 hectares of CDFmm representing 17.2% of the total CDFmm protected provincially and 487 hectares of CWHxm1 representing 4.89% of the total CWHxm1 protected provincially (see Table 1).

The most prominent biogeoclimatic subzone found in Mount Maxwell Ecological Reserve is the Coastal Douglas-fir moist maritime (CDFmm). All but the most northern section of the ecological reserve is within the CDFmm. It is significant that the ecological reserve protects 372.5 hectares of the CDFmm since only 4.0% of this biogeoclimatic subzone has been conserved within provincial and federal protected areas. Small amounts of additional CDFmm lands have been protected in other government and private conservation lands.

Table 1: Ecosystem Representation

Ecoprovince	Georgia Depression		
Ecoregion	Georgia Puget Basin		
Ecosection	Southern Gulf Islands		
Biogeoclimatic Subzone	Coastal Douglas-fir moist maritime (CDFmm) Coastal Western Hemlock xeric very dry maritime subzone eastern variant (CWHxm1)		
Representation: Area (hectares)		CDFmm	CWHxm1
Total biogeoclimatic subzone area within BC		245,313	435,310
Total biogeoclimatic subzone area protected within BC (BC Parks and National Parks of Canada)		9,783	9,985
Total biogeoclimatic subzone area protected within the six Salt Spring Island parks and ecological reserves		1,678	487
Total biogeoclimatic subzone area protected within Mount Maxwell Ecological Reserve		372.5	40
Representation: Proportion (%) of area		CDFmm	CWHxm1
% of total biogeoclimatic subzone area protected within BC (BC Parks and National Parks of Canada)		4.0%	2.29%
% of BC's total biogeoclimatic subzone area protected within the six Salt Spring Island provincial parks and ecological reserves		0.7%	0.16%
% of BC's total protected biogeoclimatic subzone area within the six Salt Spring Island provincial parks and ecological reserves		17.2%	4.89%
% of BC's total biogeoclimatic subzone area protected within Mount Maxwell Ecological Reserve		0.15%	0.01%
% of BC's total protected biogeoclimatic subzone area within Mount Maxwell Ecological Reserve		3.8%	0.40%
% of Salt Spring Island provincial parks and ecological reserves total biogeoclimatic subzone area protected with Mount Maxwell Ecological Reserve		22.2%	8.2%

Ecosystems

Mount Maxwell Ecological Reserve supports a series of ecosystems that have very restricted distribution on Salt Spring Island. With a Mediterranean-type climate and long growing season, the southern Gulf Islands and the south-eastern part of Vancouver Island form a unique ecological region in Canada. This ecological region supports many rare ecosystems, which are at risk because of intense human pressure.

The ecological reserve includes nine red-listed ecosystems in the CDFmm biogeoclimatic subzone, and two red-listed and one blue-listed ecosystem in the CWHxm1 biogeoclimatic subzone. The most prominent ecosystems in the ecological reserve are the Douglas-fir – shore pine – arbutus and Douglas-fir – salal. However, this ecological reserve protects one of the rarest ecosystems in a mosaic of areas that comprise the Garry oak meadow. These areas contain several ecosystems including the Garry oak / California brome/mixed grasses, Garry oak – oceanspray, and Garry oak - Douglas-fir – oniongrass, as well as terrestrial herbaceous fescue-camas meadows and rock outcrops. All of these communities are considered red-listed ecosystems. Red-listed and blue-listed plant species are frequently found in these ecosystem types, by virtue of their ecologically restricted niches and the limited extent of these communities.

The remainder of the ecological reserve is largely second-growth forests dominated by Douglas-fir, western hemlock, arbutus, and scattered western yew. On the lower elevations, the forests also include red alder, bigleaf maple, and grand fir.

All ecosystems found in Mount Maxwell Ecological Reserve are shown on the map in Appendix II along with a list of each polygon found in the ecological reserve and its conservation information. In addition, Appendix III provides a description of each ecosystem found in Salt Spring Island parks and ecological reserves and its status according to the British Columbia Conservation Data Centre (2009).

The ecological reserve's ecosystems have all been assigned a conservation ranking (see Appendix II). The conservation ranking provides objective and quantitative rankings of the ecological reserve's ecosystems with respect to:

- their rarity;
- the occurrence of rare elements;
- their sensitivity to disturbance;
- their resilience;
- the level of fragmentation;
- the age of the stand; and
- the presence of invasive species.

Conservation rankings within the ecological reserve range widely, reflecting the diversity of habitats and ecosystem condition. Within the area, only two polygons were ranked as low conservation value in their present condition, as these sites were clear-cut prior to being added to the ecological reserve and contain young forests. Overall, the majority of the polygons in the ecological reserve ranked high to very high for conservation value due to their association with:

- rare species;
- CDFmm biogeoclimatic subzone;
- older undisturbed age class forests;
- sites supporting communities of Garry oak and Garry oak meadows;
- ecosystems supported by very shallow soils;
- ecosystems supported by herbaceous meadows; and
- ecosystems supported by rock outcrops.

The young forest ecosystem polygons were rated as low to moderate. These young forested areas are examples of ecosystems-at-risk, and as they mature and recover from disturbance, their conservation ranking will increase since mature forests are more ecologically diverse than younger forests.



Figure 5: Mount Maxwell Ecological Reserve Garry Oak Ecosystem

Vegetation

Mount Maxwell Ecological Reserve contains significant stands of Garry oak including the red-listed ecosystems of Garry oak / California brome/mixed grasses, Garry oak / oceanspray, and Douglas-fir / Alaska oniongrass. In addition to the Garry oak stands, almost all mature coniferous and mixed forested ecosystems found in the ecological reserve have potential to support red-listed and blue-listed plant species.

Plant surveys were conducted within the ecological reserve by Dr. Hans Roemer (1999) and Dr. Adolf Ceska and Oluna Ceska (2003). Appendix IV lists the plants that the Ceskas recorded during the 2003 survey. Records of rare plant species occurring in the ecological reserve include the red-listed California hedge-parsley, scalepod, Gray's desert-parsley, and yellow montane violet and the blue-listed slimleaf onion. The Garry oak meadows are abundant with the common camas.

While invasive species were not particularly prevalent in the forested ecosystems of the ecological reserve, meadow sites often contained low to moderate cover of Scotch broom (1-25%), and similar proportions of invasive grass species. Historic homestead use of the area also included permitting livestock to forage freely, resulting in dispersal of agronomic invasive herbaceous species, such as orchardgrass, foxtail barley, bluegrass species, timothy, plantain, alfalfa, and many others. Invasive plant species were most common along the roadside in open canopy areas, and in relatively accessible meadow sites.

As forested sites are allowed to recover from disturbance, the proportion of invasive species will decrease with increasing canopy closures and the growth of native species. The shoreline ecosystem will not likely experience the same decrease in invasive species cover without intervention.



Figure 6: Common Camas

Wildlife Species and Habitats

The slopes of Mount Maxwell and the Garry oak meadows provide habitat for a variety of wildlife species and the ecological reserve is known to have a high diversity of insect fauna. A preliminary survey done by Madrone in 2003 identified 172 invertebrate species in 98 families. However, according to Madrone, many native animals have been extirpated (no longer existing) from the area, or their former numbers are greatly reduced.

Other wildlife observed in the ecological reserve includes Coastal Black-tailed Deer, Townsend's Voles, North American Deermouse, Red Squirrel, Raccoons and Pacific Chorus Frogs, and Northwestern and Common Garter Snakes. Unusually large populations of Northern Alligator Lizard are found in the ecological reserve. A wide variety of birds live and nest in the ecological reserve including Bald Eagle, Great Blue Heron, Turkey Vulture, Ruffed Grouse, Sooty Grouse, Hutton's and Cassin's Vireo, and various species of swallows. Numerous songbirds are also associated with the oak meadows and forested ecosystems (Garry Oak Ecosystems Recovery Team, 2009).

The ecological reserve's rocky slopes and open meadows also provide potential habitat for the red-listed Sharp-tailed Snake. Garry oak ecosystems support habitat for several other red-listed and blue-listed wildlife species (Garry Oak Ecosystem Recovery Team, 2009), particularly for invertebrates such as butterflies. Rare butterflies recorded in the area include the blue-listed *Propertius Duskywing* butterfly and Moss' Elfin butterfly. In addition, the blue-listed Band-tailed Pigeon lives in the ecological reserve. The red-listed Peregrine Falcon has been successfully nesting on the cliffs along the scarp of Bayne Peak since 2000, and feeds over or near the ecological reserve and Burgoyne Bay and Mount Maxwell provincial parks.

Level of Human Disturbance

Historically, fire was a common occurrence in this area and First Nations may have increased fire frequency 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. These disturbance-maintained oak meadows may be succeeding to oak forests, and eventually may become Douglas-fir – Garry oak-forested ecosystems.

In Douglas-fir dominated sites, influences of past harvesting remain in the form of stumps, woody debris, and modified tree species representation. Stocking and understory that may be atypical relative to other site characteristics reflect past disturbance to the soil and/or seedbed. Some sites showed evidence of past clear-cutting, while others were selectively harvested and/or thinned. Madrone found evidence of feral sheep grazing in the ecological reserve in both the 2003 and 2007 surveys.

Insect Infestations

Madrone (2003) and Dr. H. Roemer (2004 as cited in McIntosh, 2005) have noted that there have been numerous infestations by the Western Oak Looper in the area over time that may pose a threat to the Garry oak trees. The Mount Maxwell area was heavily infested on at least two occasions - 1980 and 1994/95 (Roemer, 2004 as cited in McIntosh, 2005). At high population levels, the larvae of this medium-sized moth will completely defoliate Garry oak trees, then, apparently, move on to defoliate other trees such as Douglas-fir. The stressed Douglas-fir trees are subject to secondary attacks by bark beetles, and combined with dry springs and summers, usually die (McIntosh, 2002).

McIntosh (2002) also reported impacts by a number of other insects including:

1. *Chionodes trichostola*; a small moth that skeletonises oak leaves; patchy but common throughout the study site;
2. *Curculio* sp.; the acorn weevil; in from about 20% to 90% of acorns (depending on the year);
3. *Disholcaspis simulata*; a gall wasp that produces relatively tiny galls on oak leaves and is uncommon throughout the study site.

2.3 Cultural Heritage

First Nations

The ecological reserve is within the traditional territory of the Chemainus First Nation, Cowichan Tribes, the Halalt First Nation, the Lake Cowichan First Nation, the Lyackson First Nation, and the Penelakut First Nation (all members of the Hul'qumi'num Treaty Group) and the Tsawwassen First Nation. The west side of Salt Spring Island, from Burgoyne Bay to Vesuvius Bay, was part of the traditional summer gathering area for Cowichan Tribes.

The following cultural information comes primarily from an archaeological report done for Mount Maxwell Ecological Reserve and area by E. McLay in 2003. In the Coast Salish Hul'qumi'num language, Mount Maxwell is known as Hwmet'utsum, 'Bent Over Place' – a mountain commemorated in Coast Salish legend and creation narratives. Oral traditions of Hwmet'utsum on Salt Spring Island describe this mountain as an important wilderness spirit place used in historical times by Coast Salish people during the winter spirit dance initiations, as well as a site for defensive refuge. First Nation heritage site conservation in the Mount Maxwell area involves not only the protection and stewardship of archaeological heritage sites determined by direct observation of physical evidence, but the recognition of intangible, symbolic heritage sites identified through the study of oral tradition.

The Mount Maxwell area is part of a larger Coast Salish ‘cultural landscape’ – a broadly defined term that integrates both these tangible and intangible elements of aboriginal land use. Mount Maxwell represents a significant First Nation archaeological heritage site on Salt Spring Island. Two inland rock shelter habitation sites have previously been recorded among the colossal boulder fall found beneath the slopes of Mount Maxwell. This archaeological reconnaissance study confirmed that the location of these two archaeological sites were in the ecological reserve. This physical evidence indicates repeated, short-term settlement of these rock shelters by past First Nation peoples over time, and further indicates physical evidence of a continuity of aboriginal settlement activity at Hwmet’utsum into the historical, if not the contemporary, era.

European Settlers

Europeans first settled the area in the mid-1800s. Mount Maxwell was originally named Mount Baynes around 1859 by Captain Richards and labelled as such on British Admiralty Chart 2840, 1861. Captain Richards named several of the mountains in the area while conducting surveys for the British Admiralty along the west coast of Canada during 1858 – 1860. Local residents began calling the mountain Mount Maxwell after the Maxwell family living in the Burgoyne Valley, resulting in the May 2, 1911, decision to adopt the name Mount Maxwell, although retaining the name Baynes Peak for the highest point on the mountain.

2.4 Research and Education

Scientific research and study of values contained in protected areas are part of BC Parks' ongoing commitment to knowledge and information gathering. Ecological research and education are appropriate activities for ecological reserves under the *Ecological Reserve Act*. Appropriate ecological scientific research and education must be consistent with the purposes set out in the *Ecological Reserve Act*.

Research Values

Mount Maxwell Ecological Reserve is rich in opportunities for scientific research. For many years, especially since the mid-1990s, botanists have visited the site in order to investigate either the plant communities or rare plants. In addition, it has been the focus of patch dynamics and coast Douglas-fir encroachment studies over the last 20 years.

Three deer and sheep-proof exclosures were built between 2002 and 2003, and have been the focus of observational plant and vegetation change monitoring studies since then. A sampling program is underway comparing vegetation inside the exclosures with vegetation outside. Two wildlife projects were initiated in late spring, 2004: a study searching for the rare Sharp-tailed Snake, as abundant potential habitat is present on site and in 2005, a comparative study of

gastropods (snails and slugs) inside and outside the exclosures. A recent M.Sc. study focused on the effect of meadow connectivity, and meadow qualities of density of host plants, nectar plants, and Scotch broom, on the presence and/or absence of populations of three species of butterflies, including two blue-listed species, on Mount Maxwell.



Figure 7: Mount Maxwell Ecological Reserve Exclosure Fence

Education Values

Educational activities are an important purpose of ecological reserves. The diversity of landscapes and habitats on Mount Maxwell offers numerous education opportunities. Education will promote understanding of the dry coastal ecosystems represented here, as well as the ecological and cultural importance of the ecological reserve. Over the past few years, a number of groups, including the Salt Spring Island Conservancy, in cooperation with TNT, have visited the site to learn more about the ecosystems and species on site. The Coast Mountain Field Institute has designed a botany course focusing on Garry oak ecosystems that takes place in, or near, the Mount Maxwell Ecological Reserve.

3.0 Management Direction

Management direction for Mount Maxwell Ecological Reserve is guided by the *Ecological Reserve Act*. Ecological reserves are areas selected to conserve representative and special natural ecosystems, plant and animal species, landscape features, and phenomena. The goals of ecological reserves are to contribute to the maintenance of biological diversity and the protection of genetic materials. Appropriate scientific research and educational functions are the primary uses of ecological reserves. Ecological reserves are not established for recreation, though most ecological reserves are open to the public for non-consumptive, observational uses. Activities such as hunting, camping, removal of plants or animals, and the use of motorized vehicles are prohibited.

3.1 Vision

Mount Maxwell Ecological Reserve conserves a representative example of the dry Coastal Douglas-fir biogeoclimatic zone, in particular the red-listed Garry oak ecosystem, as well as other species-at-risk. It conserves regionally significant cultural values, as it is important in Cowichan Tribes traditions as an area of spiritual significance connected to the creation story of the Hul'qumi'num people. In addition, it provides opportunities for research and education on the natural environment including important baseline information on the effects of climate change, which can be useful information for managing these effects elsewhere.



Figure 8: Mount Maxwell Ecological Reserve Garry Oak Meadow

3.2 Management Objectives, Issues, and Strategies

Table 2 outlines the management objectives and issues, and strategies to address them.

Table 2: Management Objectives, Issues, and Strategies

Objectives	Issues	Strategies
CONSERVE AND PROTECT NATURAL ECOLOGICAL VALUES		
To maintain the long-term natural diversity of ecosystems in the ecological reserve and to conserve and protect natural values, including species-at-risk.	<p>Species-at-risk are likely found in the ecological reserve but there is a lack of information about the presence and location of these species.</p> <p>Lack of understanding about the health of the Garry oak trees and meadows in the ecological reserve.</p>	<ul style="list-style-type: none"> • Encourage authorized local groups to participate in research and vegetation management initiatives. • Implement, where feasible, the Garry Oak Ecosystems Recovery Teams’ Goals and Strategies (Appendix V); • Initiate and foster research on Garry oak ecosystems and species-at-risk. • Work with the relevant provincial agencies, Pacific Forestry Centre, Garry Oak Ecosystem Recovery Team, and others to determine the health of the Garry oak trees and to monitor the stand for harmful insects.
	Sensitive ecosystems and species-at-risk are threatened by the introduction of invasive species including plants, feral animals, and an unnaturally high population of deer.	<ul style="list-style-type: none"> • Collaborate with Invasive Species Council of BC, other agencies, stakeholders, and the public on the reduction and/or eradication of invasive plants and feral animals. • Feral animals (e.g. sheep) are causing impacts to the native plant species. Conduct control and/or removal of feral animals as resources permit. • Assess and monitor the impacts of deer on sensitive ecosystems and species-at-risk. • Monitor the results of management controls.
	<p>Garry oak ecosystems and associated species-at-risk are at risk from succession and long-term fire suppression.</p> <p>There is a threat of a severe forest fire from unnatural forest fuel loads in the ecological reserve and adjacent properties.</p>	<ul style="list-style-type: none"> • Develop a fuel management plan that defines long-term fuel management objectives and actions. • Assess potential for controlled burns or mechanical thinning to maintain Garry oak meadow ecosystem. • Update fire management and emergency response plans to recommend minimum levels of heavy equipment and retardant use.
	Reptile and invertebrate populations are at risk from Mount Maxwell Road traffic.	<ul style="list-style-type: none"> • Monitor reptile and invertebrate mortality due to Mount Maxwell Road traffic.
	Nesting bird habitats are at risk from impacts of rock-climbing, hand gliding, and paragliding.	<ul style="list-style-type: none"> • Rock climbing, paragliding, and hand gliding are inappropriate in the ecological reserve to ensure protection of nesting birds.
	Some types of recreational use are negatively impacting the sensitive ecosystems.	<ul style="list-style-type: none"> • Monitor recreational use and take appropriate compliance and enforcement action against inappropriate uses, including unauthorized trail building, mountain biking and motorized vehicle use (ATVs and dirt bikes). • Direct Mount Maxwell Provincial Park trails away from the boundary of the ecological reserve and increase barriers and monitoring to control human impacts on sensitive natural values.

Objectives	Issues	Strategies
CLIMATE CHANGE		
To gain a better understanding of the effects of climate change on the ecological reserve's natural values.	Species-at-risk and ecosystems-at-risk may be negatively impacted by climate change related variations to precipitation and temperature.	<ul style="list-style-type: none"> • Encourage ongoing research on native plants and ecosystems to get a better understanding of the effects of climate change on these values. • Adopt, as appropriate, management actions that may be identified through climate change research in the ecological reserve.
RESEARCH AND EDUCATION		
To improve knowledge and understanding of the ecological reserve's ecological values.	Scientific research is needed on ecosystems and species-at-risk, invasive species, effects of long-term fire suppression, etc.	<ul style="list-style-type: none"> • Encourage research projects and initiate long-term relationships with a variety of qualified research partners including other government agencies, environmental non-government organizations, and post-secondary institutions. • Encourage and support research activities in the ecological reserve to increase the knowledge of its ecological values. • Continue photo-monitoring activities, including evaluating photo-monitoring from 2002 (McIntosh 2002); re-photograph selected locations, and establish new photo points. • Assemble the results of completed research projects in the ecological reserve in a database of research conducted by BC Parks and others.
	Research permits are required for all research in the ecological reserve.	<ul style="list-style-type: none"> • Ensure all research activities in the ecological reserve follow BC Parks guidelines.
	Public knowledge is lacking regarding the purpose of this ecological reserve and ecological reserves generally.	<ul style="list-style-type: none"> • Develop signage for information shelters in the provincial parks on Salt Spring Island that includes pertinent information regarding the ecological reserves on the island.
CONSERVE, PROTECT AND RESPECT CULTURAL HERITAGE VALUES		
To conserve, protect, and respect cultural values and maintain First Nations social, ceremonial, and cultural uses.	Limited knowledge of the ecological reserve's cultural values, including archaeological sites and First Nations' cultural uses, make it difficult to protect these values.	<ul style="list-style-type: none"> • Continue building relationships with First Nations concerning the protection of archaeological sites and their cultural use of the ecological reserve. • Ensure management direction is developed for any new sites or values identified.

Objectives	Issues	Strategies
RELATIONSHIP WITH PARTNERS, STAKEHOLDERS, AND NEIGHBOURS		
To maintain a good relationship with partners, stakeholders and neighbours.	Collaboration with The Nature Trust of B.C., other agencies, and stakeholder groups on the management of the ecological reserve and surrounding properties is required to ensure the protection of the ecological reserve's values.	<ul style="list-style-type: none"> • Work with TNT on implementation of this management plan and the allocation of funds from The Nature Trust Mount Maxwell Land Account. • Provide TNT with an annual report on activities and accomplishments in the ecological reserve. • Continue to maintain the volunteer ecological reserve warden program. • Work collaboratively with other agencies and stakeholders to manage provincial and other protected lands in the area.
LAND USE AND INTERESTS MANAGEMENT		
To integrate adjacent land use issues and interests in the management of the ecological reserve.	<p>Accurate identification of boundary location on the ground.</p> <p>Potential impacts from increased visitor use from the Mount Maxwell Road and Mount Maxwell and Burgoyne Bay provincial parks.</p> <p>Potential impacts from development of adjacent private and protected lands.</p>	<ul style="list-style-type: none"> • Post signs in key areas to identify the ecological reserve boundary. • Sign and monitor access points into the ecological reserve from Mount Maxwell Road and Mount Maxwell and Burgoyne Bay provincial parks. • Review and reduce any impacts from brushing along the BC Hydro right-of-way adjacent to the ecological reserve. • Monitor adjacent land development and work collaboratively with landowners to mitigate any issues identified.

4.0 Plan Implementation

4.1 Policy Context

In addition to any protected area specific policies highlighted in the management plan, there are numerous other provincial/regional policies and guidelines that will be considered during management plan implementation. This includes items such as BC Parks' policies on conservation, permitting, and impact assessment processes.

4.2 Implementation

The management of Mount Maxwell Ecological Reserve will conform to the directions set forth in this management plan and the lease agreements with TNT. The implementation of the outlined management strategies is subject to the availability of resources. As capacity allows, BC Parks will facilitate discussions with First Nations, The Nature Trust of B.C., and stakeholders to identify and determine how to implement management strategies. Monitoring of the ecological reserve will require close cooperation and involvement with the ecological reserve warden, the community, First Nations, partner groups, and stakeholders to ensure that the ecological reserve is well managed and the ecological reserve's values are maintained and protected.

BC Parks will continue to coordinate the management of the ecological reserve with The Nature Trust of B.C., the ecological reserve warden, First Nations, the Salt Spring Island Conservancy, The Nature Conservancy of Canada, The Land Conservancy of B.C., Islands Trust, the Capital Regional District, and other stakeholders.

4.3 Adaptive Management

In order to ensure the management of the ecological reserve remains relevant and effective, an adaptive management approach will be used. Adaptive management involves a five-step process of planning, action, monitoring, evaluation, and revision of the management plan to reflect lessons learned, changing circumstances, and/or objectives achieved. Adaptive management is flexible, collaborative, and responsive to public input.

The management plan will be reviewed as required by BC Parks and TNT. A review of the management plan should generally be triggered by the complexities of the management issues in the protected area and/or a significant change in circumstances (e.g., a natural disaster, major environmental change, or discovery of a major new archaeological site), and not by a specific time period.

A management plan review determines whether any updates to the management plan are required to: keep management direction current and relevant; correct the intent of a policy statement; address some error or omission; and/or address a new proposal. Any updates or changes to the content of the management plan will be addressed through a formal management plan amendment process including an opportunity for public input.



Figure 9: Mount Maxwell Ecological Reserve

5.0 References

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6.0 Glossary

Blue List	List of ecosystems, and indigenous species and subspecies of special concern (formerly vulnerable) in British Columbia.								
COSEWIC	Committee on the Status of Endangered Wildlife in Canada is a committee of experts that assesses and designates which wildlife species are in some danger of disappearing from Canada.								
Ecological Community	The BC Conservation Data Centre and NatureServe use this term to include natural plant communities and plant associations and the full range of ecosystems that occur in British Columbia. These may represent ecosystems as small as a vernal pool, or as large as an entire river basin, an Ecoregion or a Biogeoclimatic Zone.								
Ecoregion	The Ecoregion Classification system is used to stratify British Columbia's terrestrial and marine ecosystem complexity into discrete geographical units at five levels. The two highest levels, Ecodomains and Ecodivisions, are very broad and place British Columbia globally. The three lowest levels, Ecoprovinces, Ecoregions, and Ecosections are progressively more detailed and narrow in scope and relate segments of the province to one another. They describe areas of similar climate, physiography, oceanography, hydrology, vegetation, and wildlife potential. Within each terrestrial ecoregion, climatic zones occur where specific soils, plant and animal communities and aquatic systems develop because of the interaction of climate with the land surface and surficial materials. These zones are defined within the Biogeoclimatic Ecosystem Classification system . For a complete explanation of this complex classification system, visit http://www.env.gov.bc.ca/ecology/ecoregions/index.html/								
Ecosystem	An ecosystem is a dynamic complex of plant, animal, and microorganism communities and the nonliving environment interacting as a functional unit. Ecosystems vary enormously in size: a temporary pond in a tree hollow and an ocean basin can both be ecosystems.								
Ecosystem at Risk	An extirpated, endangered or threatened ecosystem or an ecosystem of special concern (formerly called vulnerable).								
Endangered	Facing imminent extirpation or extinction.								
Extinct	Species that no longer exist.								
Extirpated	A species or an ecosystem that no longer exist in the wild in an area but does occur elsewhere.								
Forest	Ecosystem Group in BC Species and Ecosystems Explorer: ecosystems with greater than 10% tree cover including coniferous, deciduous, and mixed forests with more-or-less continuous canopies and trees not clumped.								
Forest Structure	<table> <tr> <td>Pole/Sapling Trees</td> <td>less than 40 years old</td> </tr> <tr> <td>Young Forest</td> <td>40 - 80 years old</td> </tr> <tr> <td>Mature Forest</td> <td>80 - 250 years old</td> </tr> <tr> <td>Old-growth Forest</td> <td>250 years or older</td> </tr> </table>	Pole/Sapling Trees	less than 40 years old	Young Forest	40 - 80 years old	Mature Forest	80 - 250 years old	Old-growth Forest	250 years or older
Pole/Sapling Trees	less than 40 years old								
Young Forest	40 - 80 years old								
Mature Forest	80 - 250 years old								
Old-growth Forest	250 years or older								
Herbaceous	Ecosystem Group in BC Species and Ecosystems Explorer: ecosystems dominated by herbaceous vegetation. Shrubs generally account for less than 20% of vegetation cover, and tree cover is generally less than 10%.								

Invasive Species Species those are not native to an area and whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

Polygons In mapping, any multi-sided area that shares the same characteristics; commonly used to map ecosystems.

Provincial Conservation Status Ranking Conservation status rank for an element occurring or formerly occurring in B.C.

Status	Definition
SX	Presumed Extirpated—Species or community is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered
SH	Possibly Extirpated (Historical)—Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20 - 40 years. A species or community could become SH without such a 20 - 40 year delay if the only known occurrences in a nation or state/province were destroyed or if it had been extensively and unsuccessfully looked for. The SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.
S1	Critically Imperilled—Critically imperilled in the province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the province.
S2	Imperilled—Imperilled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the province.
S3	Vulnerable—Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4	Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5	Secure—Common, widespread, and abundant in the nation or state/province.
SNR	Unranked—Nation or state/province conservation status not yet assessed

Provincial Lists List of elements considered to be either endangered or threatened (Red List), special concern (Blue List) or not at risk (Yellow List) in B.C.

Red List List of ecosystems, and indigenous species and subspecies that are extirpated, endangered, or threatened in British Columbia. Red-listed species and sub-species may be legally designated as, or may be considered candidates for legal designations as Extirpated, Endangered, or Threatened under the *Wildlife Act* (see <http://www.env.gov.bc.ca/wld/faq.htm#2>). Not all Red-listed taxa will necessarily become formally designated. Placing taxa on these lists flags them as being at risk and requiring investigation.

Riparian Ecosystem Group in BC Species and Ecosystems Explorer: ecosystems influenced by proximity to water bodies (rivers, streams, lakes) and processes associated with moving water.

Riparian Habitats	Areas situated, or dwelling on the bank of a river or other body of water
Sparsely Vegetated	Ecosystem Group in BC Species and Ecosystems Explorer: ecosystems dominated by exposed rock or mineral soil, with a generally sparse vegetation layer (less than 10 - 25% cover) dominated by lichens and xerophytes, or low herbaceous vegetation.
Species at Risk	An extirpated, endangered, or threatened species or a species of special concern (formerly called vulnerable).
Special Concern	Particularly sensitive to human activities or natural events but not endangered or threatened (as used by COSEWIC - A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.) Special Concern was formerly referred to as Vulnerable.
Threatened	Likely to become endangered if limiting factors are not reversed.
Vulnerable	Particularly sensitive to human activities or natural events. (As used by NatureServe - Vulnerable due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.)
Yellow List	List of ecosystems and indigenous species that are not at risk in British Columbia.

Appendix I: Mount Maxwell Ecological Reserve Summary of Public Consultation

Through input provided at one public meeting, two public open houses, one stakeholder meeting, and through mail, e-mail, and the website, in 2007 and 2008, the public showed overall support for the key values and issues identified for this ecological reserve. The public's main concerns were natural and cultural values protection balanced with recreational use.

The significance of the Garry oak meadows and the sensitivity of the ecosystem in the ecological reserve were the main concerns voiced in the comments received and the need for the highest protection possible and maintaining as small an impact footprint as possible. The need for better knowledge of the natural and cultural history for this site was also brought forward. In addition, there were requests for more information on site about the natural and cultural history of the ecological reserve and trails that were accessible in it.

Key values, activities, and management issues identified through the management planning process included:

Key Ecological Values:

- Pristine nature; and,
- Natural and cultural history.

Appropriate Activities:

- Research and education

Key Management Issues:

- Protection of the sensitive ecosystems;
- The impacts of recreation use including hiking, camping, fires and off road vehicle traffic in sensitive areas;
- Lack of public information on the role of an ecological reserve and the reasons for limited access into the area;
- Lack of knowledge of aboriginal history, archaeological sites, unique flora and forest, eagles nesting and other forest birds;
- The need for protection of aboriginal history, archaeological sites, unique flora and forest, eagles nests, and other forest birds;
- The introduction of non native species; and,
- Addressing unsanctioned trail building.

Appendix II: Terrestrial Ecosystem Mapping



LEGEND

ECO SECTION & BIOGEOCLIMATIC UNITS		ECO SYSTEM UNIT LABEL	
	<p>← Ecosection</p> <p>← Biogeoclimatic Unit</p>	<p>Polygon ID — 32</p> <p>Percentile — 50</p> <p>Site Modifier — C Lc</p> <p>Disturbance Code — 50Fz5 M</p> <p>Ecosystem Unit —</p> <p>Stand Composition —</p> <p>Structural Stage —</p>	
MAP SYMBOLS			
<p>==== Road</p> <p>— Rivers & Creeks- Definite</p> <p>- - - Rivers & Creeks - Indefinite</p> <p>— Biogeoclimatic Unit</p> <p>□ Ecosystem Unit</p> <p>□ Parks & Ecological Reserves</p>	<p>● Plot Location - Maxwell TEM (2003)</p> <p>● Plot Location - CDF TEM (2007)</p> <p>☞ Rare Bird</p> <p>☞ Rare Plant</p> <p>☞ Rare Plant Community (Forest)</p> <p>☞ Rare Plant Community (Oak)</p>	<p>Conservation Rank</p> <p>Very High</p> <p>High</p> <p>Moderate</p> <p>Low</p> <p>Very Low</p>	

Appendix III: Terrestrial Ecosystem Mapping Polygon Codes and Status

Mount Maxwell Ecological Reserve ecosystems in *italic bold red and blue*

COASTAL DOUGLAS FIR MOIST MARITIME BIOGEOCLIMATIC SUBZONE			
<i>Polygon Code</i>	<i>Ecosystem</i>	<i>Rating</i>	<i>Status</i>
CS	western redcedar / slough sedge	S2S3	Blue
DA	<i>Douglas-fir - arbutus (lodgepole pine or shore pine)</i>	S2	Red
DG	<i>Douglas-fir - grand fir / dull Oregon-grape</i>	S2	Red
DO	<i>Douglas-fir / Alaska oniongrass</i>	S1	Red
DS	<i>Douglas-fir / salal (Dry Maritime)</i>	S2	Red
FC	<i>Roemer's fescue – camas</i>	S1	Red
GO	<i>Garry oak / oceanspray</i>	S1	Red
HL	hardhack – Labrador tea	S3	Blue
QB	<i>Garry oak / California brome/mixed grasses</i>	S1	Red
RF	western redcedar – grand fir/three-leaved foamflower (Very Dry Maritime)	S2	Red
RK	<i>western redcedar - Douglas-fir / Oregon beaked-moss</i>	S1	Red
RP	western redcedar / Indian-plum	S1	Red
RS	western redcedar / common snowberry	S1	Red
RV	western redcedar / vanilla leaf	S1	Red
SC	<i>Cladina (reindeer lichen) – Wallace's selaginella</i>	S2	Red

COASTAL WESTERN HEMLOCK, VERY DRY MARITIME BIOGEOCLIMATIC SUBZONE			
<i>Polygon Code</i>	<i>Ecosystem</i>	<i>Rating</i>	<i>Status</i>
AM	arbutus / hairy manzanita	S2	Red
DC	Douglas-fir - lodgepole pine / Cladina (reindeer lichen)	S2	Red
DF	<i>Douglas-fir / sword fern</i>	S2	Red
DS	<i>Douglas-fir - western hemlock / salal (Dry Maritime)</i>	S2S3	Blue
HD	western hemlock - western redcedar / deer fern	S2	Red
HL	hardhack – Labrador tea	S3	Blue
HK	<i>western hemlock - Douglas-fir / Oregon beaked-moss</i>	S2	Red
RF	western redcedar / three-leaved foamflower (Very Dry Maritime)	S2	Red
RS	western redcedar / sword fern (Very Dry Maritime)	S2S3	Blue
SC	Cladina (reindeer lichen) – Wallace's selaginella	S2	Red

OTHER features found in Mount Maxwell Ecological Reserve in <i>italic bold</i>			
Polygon Code	Feature	Polygon Code	Feature
BE	Beach	ES	Exposed Soil
CF	Cultivated Field	GP	Gravel Pit
CL	<i>Cliff</i>	RO	<i>Rocky Outcrop</i>
CO	Cultivated Orchard	RW	Rural Residential

Appendix IV: Mount Maxwell Ecological Reserve Plant Species List

List of Vascular Plants, Bryophytes, and Fungi of Mount Maxwell Ecological Reserve and Provincial Park by Dr. Adolf and Oluna Ceska, April 10, 2003. (Updated with common names by Tania Tripp, October 2007)

Alphabetical Scientific Name - (BC CDC red-listed species in **bold red** and blue-listed in **bold blue**)

Scientific name	English Name
<i>Abies grandis</i>	grand fir
<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 amplexans</i> (blue-listed)	slimeleaf onion
<i>Allium cernuum</i>	nodding onion
<i>Anthoxanthum odoratum</i>	vernal grass
<i>Anthriscus caucalis</i>	burr chervil
<i>Alnus rubra</i>	red alder
<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 brodiaea
<i>Bromus vulgaris</i>	common brome
<i>Calandrinia ciliata</i>	desert rock purslane
<i>Calypso bulbosa</i>	fairly-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> (blue-listed)	farewell-to-spring
<i>Claytonia exigua</i>	pale spring beauty

Scientific name	English Name
<i>Claytonia perfoliata</i>	miner's-lettuce
<i>Claytonia rubra</i>	redstem springbeauty
<i>Claytonia siberica</i>	Siberian miner's lettuce
<i>Clinopodium douglasii</i>	yerba buena
<i>Collinsia grandiflora</i> var. <i>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>Idahoia scapigera</i> (red-listed)	scalepod
<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 fringecup
<i>Lomatium grayi</i> (red-listed)	Gray's desert parsley
<i>Lomatium utriculatum</i>	spring gold
<i>Lonicera ciliosa</i>	western trumpet
<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

Scientific name	English Name
<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 (coast)
<i>Quercus garryana</i>	Garry oak
<i>Ranunculus occidentalis</i>	western buttercup
<i>Rosa gymnocarpa</i>	baldhip rose
<i>Rosa nutkana</i>	Nootka 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>Symphoricarpos albus</i>	common snowberry
<i>Symphoricarpos hesperius</i>	trailing snowberry
<i>Taraxacum officinale</i>	common dandelion
<i>Taxus brevifolia</i>	western yew
<i>Teesdalia nudicaulis</i>	shepherd's cress
<i>Thuja plicata</i>	western redcedar
<i>Trifolium repens</i>	white clover
<i>Trifolium variegatum</i>	white-tipped clover
<i>Trifolium wormskoldii</i>	springbank clover

Scientific name	English Name
<i>Tsuga heterophylla</i>	western hemlock
<i>Urtica dioica</i>	stinging nettle
<i>Verbascum thapsus</i>	great mullein
<i>Vicia lathyroides</i>	spring vetch
<i>Viola praemorsa</i> ssp. <i>praemorsa</i>	yellow montain violet (red-listed)
<i>Yabea microcarpa</i> (red-listed)	California hedge parsley

Alphabetical Common Name - (BC CDC red-listed species in **bold red** and blue-listed in **bold blue**)

English Name	Scientific name
Alaska oniongrass	<i>Melica subulata</i>
arbutus	<i>Arbutus menziesii</i>
baldhip 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 hedge parsley (red-listed)	<i>Yabea microcarpa</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>
Common snowberry	<i>Symphoricarpos albus</i>
desert rock purslane	<i>Calandrinia ciliata</i>
Douglas-fir (coast)	<i>Pseudotsuga menziesii</i>
dove-foot geranium	<i>Geranium molle</i>

English Name	Scientific name
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>
grand fir	<i>Abies grandis</i>
great mullein	<i>Verbascum thapsus</i>
Gray's desert parsley (red-listed)	<i>Lomatium grayi</i>
hairy bitter-cress	<i>Cardamine hirsuta</i>
hairy cat's-ear	<i>Hypochaeris radicata</i>
hairy honeysuckle	<i>Lonicera hispidula</i>
harvest brodiaea	<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</i> var. <i>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>
Nootka rose	<i>Rosa nutkana</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 alder	<i>Alnus rubra</i>
red columbine	<i>Aquilegia formosa</i>
red fescue	<i>Festuca rubra</i>

English Name	Scientific name
redsteam springbeauty	<i>Claytonia rubra</i>
Roemer's fescue	<i>Festuca roemeri</i>
rose campion	<i>Lychnis coronaria</i>
scalepod (red-listed)	<i>Idahoa scapigera</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>
slimeleaf onion (blue-listed)	<i>Allium amplexans</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 fringe-cup	<i>Lithophragma parviflorum</i>
small-flowered nemophila	<i>Nemophila parviflora</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>
trailing snowberry	<i>Symphoricarpos hesperius</i>
vernal grass	<i>Anthoxanthum odoratum</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>
western hemlock	<i>Tsuga heterophylla</i>
western redcedar	<i>Thuja plicata</i>
western trumpet	<i>Lonicera ciliosa</i>

English Name	Scientific name
western yew	<i>Taxus brevifolia</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>
yellow montain violet (red-listed)	<i>Viola praemorsa ssp. praemorsa</i>
yerba buena	<i>Clinopodium douglasii</i>

Bryophytes	Fungi
<i>Antitrichia curtipendula</i>	<i>Cortinarius</i> subgen. <i>Telamonia</i>
<i>Bryum</i> sp.	<i>Dacryomyces palmatus</i>
<i>Dicranum scoparium</i>	<i>Nolanea hirtipes</i>
<i>Eurhyncium oregonum</i>	<i>Psathyrella</i> sp.
<i>Hedwigia stellata</i>	<i>Psilocybe inquilina</i>
<i>Homalothecium</i> sp.	<i>Psilocybe montana</i>
<i>Mnium</i> sp.	
<i>Philonotis fontana</i>	
<i>Polytrichum juniperinum</i>	
<i>Polytrichum piliferum</i>	
<i>Racomitrium elongatum</i>	
<i>Rhytidiadelphus triquetrus</i>	
<i>Riccia sorocarpa</i>	
<i>Tortula</i> sp.	

Appendix V: Garry Oak Ecosystem Recovery Team Goals & Strategies

The Garry Oak Ecosystem Recovery Team identifies five strategic approaches for recovery of Garry oak ecosystems (GOERT, 2008).

Goals	Strategies
1. Complete the inventory, mapping and plant community classification	Develop standardized plant community classification, and determine and map the historical and current extent of Garry oak and associated ecosystems.
2. Protection of ecosystems and essential ecosystem characteristics	Secure high priority sites towards the establishment of a network of protected areas that represent the full diversity of Garry oak and associated ecosystems throughout their geographic range in Canada that are of sufficient size and appropriately situated to sustain essential ecosystem characteristics over the long term
3. Restoration and management of protected areas, landscape linkage, buffers, and the general landscape	Facilitate the establishment of landscape linkages and buffers and promote the restoration and management of protected areas, landscape linkages, buffers, and the general landscape to sustain essential ecosystem characteristics over the long term.
4. Protection and recovery of species at risk	Complete assessment and initial planning, initiate actions towards sustaining and expanding populations of species at risk in Garry oak, and associated ecosystems that are designated Endangered, Threatened, or are of management concerns.
5. Research	Expand basic and applied research relevant to conserving and restoring Garry oak and associated ecosystems.
6. Outreach	<ul style="list-style-type: none"> • Ensure that conservation of Garry oak and associated ecosystems in incorporated into the planning and programs of governmental and non-governmental agencies • Develop public awareness of, support for, and participation in recovery activities • Facilitate communication, coordination, and information sharing among recovery partners to ensure efficient, coordinated delivery of the recovery program.