Cyril Cunningham Nature Reserve Management Plan, Salt Spring Island

Prepared by the

ISLANDS TRUST FUND

Approved by
the Trust Fund Board, November 22, 2016
Resolution # TFB-2016-033
Salt Spring Island Conservancy, February 14, 2017 and
Habitat Acquisition Trust, February 22, 2017

i. Executive Summary

Cyril Cunningham Nature Reserve is a 3.84 hectare (9.49 acre) area on the south end of Salt Spring Island overlooking Satellite Channel and the Saanich Peninsula. The reserve is on Mt. Tuam and is within the asserted traditional territory of 13 First Nations and 2 Treaty Groups. Coast Salish First Nations have had a presence on these lands for thousands of years[1].

Cyril Cunningham Nature Reserve was transferred to the Islands Trust Fund Board (TFB) in 1994 by the Cunningham family and associates after establishing a subdivision on their Cape Keppel property. A Section 219 Conservation Covenant and Section 218 Statutory Right of Way in favour of the Salt Spring Island Conservancy (SSIC) and Habitat Acquisition Trust (HAT) were registered on the reserve in 2014.

The reserve is part of a 400 hectare continuous area of protected and provincial land known as the Mount Tuam Special Management Area (SMA). The SMA is being cooperatively managed by a multi-jurisdictional group known as the Mount Tuam Special Management Area Resource Team (SMART). Four provincially red-listed plant communities have been identified to date as well the blue-listed leafless wintergreen (*Pyrola aphylla*).

The Islands Trust Fund (ITF) manages nature reserves and protected areas to ensure that ecological communities and native species are protected in perpetuity. The management vision for Cyril Cunningham Nature Reserve is to protect the unique ecological values in perpetuity in order to support a diverse range of native plants and animals. The current threats to this vision include off-road vehicle traffic, overgrazing, invasive species and conifer encroachment associated with fire suppression.

In order to achieve the management vision, the following actions are recommended as resources permit:

1. Conduct annual site visits to monitor covenant compliance and identify management concerns.
2. Work with BC Hydro, Telus, and the Victoria Airport Authority to develop Best Management Practices for managing the utility line right of way to minimize negative impacts to the reserve as well as the conservation covenants to the south of the reserve.

[1] The Trust Fund Board recognizes that the language commonly used to refer to land is disrespectful to First Nations. For example, notions of 'private' and 'Crown' land do not appropriately recognize aboriginal title and infer a belief in the concept of *terra nullius*, the idea that land was not owned prior to the assertion of European sovereignty. The Trust Fund Board acknowledges that *terra nullius* is a concept that doesn't apply to the Islands Trust Area and in the absence of more appropriate language, uses the terms 'private' and 'Crown' land to mean land that is currently managed by either private individuals/agencies or the government.

3. Develop strategies to managing invasive species in the Garry Oak meadows and in the utility line right of way
4. Support ongoing research to inform management, provided it does not negatively impact sensitive species.

The action items will be addressed in priority sequence by Islands Trust Fund staff as resources permit.

ii. Tables, Lists and Maps

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Acknowledgements

The Islands Trust Fund acknowledges the vision and generosity of the Cunningham family, protecting this land as a nature reserve.

The Islands Trust Fund would like to thank Carrina Maslovat for providing the ecological inventory and management recommendations for the management plan.

1.0 Introduction

Cyril Cunningham Nature Reserve is a 3.84 hectare (9.49 acre) area on the south end of Salt Spring Island overlooking Satellite Channel and the Saanich Peninsula. It is a long East-West strip that runs a steep course across the lower slopes of Mount Tuam directly above Cape Keppel. It includes about 0.32 ha of open rock outcrop and 3.52 ha of second-growth forest.

The reserve is owned by the Trust Fund Board who work with the covenant co-holders, Salt Spring Island Conservancy (SSIC) and Habitat Acquisition Trust (HAT) to manage the property in order to protect the unique ecological values of the Cyril Cunningham Nature Reserve.

1.1. Islands Trust Fund (ITF) and the Trust Fund Board (TFB)

In 1974 the Province of British Columbia recognized the islands between Vancouver Island and the mainland as a special place within the province where the unique beauty, rural character and diverse ecosystems should be protected for future generations. Through the *Islands Trust Act*, the province established the Islands Trust, a local government, with the following mandate (known as the Object of the Islands Trust):

> "*To preserve and protect the trust area and its unique amenities and environment for the benefit of the residents of the trust area and of British Columbia generally, in cooperation with municipalities, regional districts, improvement districts, other persons and organizations and the government of British Columbia"* (Islands Trust 2015).

In 1990, through the enactment of a section of *Islands Trust Act*, the ITF was established as a conservation land trust to assist in carrying out the "preserve and protect" mandate. Part 6 of the *Islands Trust Act* establishes the corporate status, responsibilities, and governance structure of the TFB. The TFB is one of fifteen corporate entities[2] charged to uphold the Object of the Islands Trust. It is responsible for the actions of the ITF and since 1990 has protected over 1,184 hectares (2,926 acres) of land as nature reserves and conservation covenants.

[2] The Corporate entities charged to uphold the Object of the Islands Trust include the Trust Council, twelve local trust committees, one island municipality and the TFB.

The vision of the ITF is that the islands and waters of the Strait of Georgia and Howe Sound will be a vibrant tapestry of culture and ecology where humans live and work in harmony with the natural world. This special place will have a network of protected areas that preserve in perpetuity the native species and natural systems of the islands. Engaged residents and conservation partners will work together to protect large natural areas and key wildlife habitat. Viable ecosystems will flourish alongside healthy island communities.

The mission of the ITF is to protect special places by encouraging, undertaking and assisting in voluntary conservation initiatives within the Islands Trust Area. ITF Nature Reserves are managed to maintain, preserve and protect the natural features and values of ecosystems. This level of protection is similar to the International Union for Conservation of Nature (IUCN) protected area Category 1B: Wilderness area:

> "*large area of unmodified or slightly modified land and/or sea; retaining its natural character and influence, without permanent or significant habitation, which is protected and managed in order to preserve its natural condition"* (Lockwood, 2006).

1.2 Purpose of Islands Trust Fund Management Plans

ITF management plans provide background information and set out the direction of property management as follows:

- Provide general and descriptive information on the property, including location, history, and land use;
- Set out the conservation goals and objectives for the property;
- Identify the property's ecological and/or cultural values and features;
- Describe the management issues associated with the property; and,
- Provide short, medium and long-term management recommendations (action items or tasks) on issues such as: Species at Risk protection; ecological restoration; public access; educational and research opportunities; invasive species management; and signage needs.

Once the management plan process is complete, the ITF will work to carry out the management actions or strategies identified in the plan, as resources allow. Following general practice and as outlined in the conservation covenant and statutory right of way, the ITF will revise the Management Plan every ten years.

1.3 Nature Reserve Purpose

The purpose of Cyril Cunningham Nature Reserve is to:

- Preserve and protect the natural values of the forest and its connections to surrounding protected area;
- Protect populations of provincially blue-listed leafless wintergreen (*Pyrola aphylla*) and the four rare plant communities identified to date, as well as any potential Species at Risk that may be discovered in future surveys;

- Allow natural succession of the reserve's ecosystems to occur unimpeded without human intervention, except in the case of wildfire or other exceptional situations where remediation is considered imperative; and,
- Protect the site in accordance with the objectives outlined in Section 1.4.

1.4 Nature Reserve Objectives

The Islands Trust Fund objectives for the management of Cyril Cunningham Nature Reserve are to:

- Preserve the natural features and functions of the land;
- Protect and, where necessary and feasible, restore the plant and animal communities and ecological processes at the reserve;
- Permit only uses that do not significantly impair the natural condition of the reserve or its special features such as management of invasive species or monitoring to guide management actions;
- Support ongoing inventory, mapping and monitoring to guide management provided it does not interfere with Species at Risk protection.

2.0 Property Information

Cyril Cunningham Nature Reserve is a 3.84 hectare area on the south end of Salt Spring Island overlooking Satellite Channel and the Saanich Peninsula. This strip of land runs a steep course across the lower slopes of Mount Tuam directly above the northern boundary of the Strata Lots below (map in Figure 2). There is a right of way in favour of the Government of Canada through the eastern portion of the reserve for access to navigation equipment in the provincial Crown land to the north (map in Figure 4). The right of way also permits maintenance of utility lines. The reserve is within the asserted traditional territory of 13 Coast Salish First Nations.

2.1 Location

To reach the property from the B.C. Ferry dock in Fulford Harbour drive north on the Fulford Ganges Road to the head of Fulford Harbour then bear left up Isabella Point Road for about 4 km to Mountain Road on the right. From here it is approximately 6.5 km on a rough road to the terminus where a gate designates the private land, Strata Lot 1 (map in Figure 2). A walk straight uphill from here will reveal the eastern boundary of the reserve.

2.2 Legal Description

Parcel Identifier Number: 018-650-422

Lot B, Section 32, South Salt Spring Island, Cowichan District, Plan VIP 58173

2.3 Local and Regional Context

The reserve is part of a 400 hectare continuous area of protected, federal and provincial land known as the Mount Tuam Special Management Area (SMA). The SMA is being cooperatively managed by a multi-jurisdictional group known as the Mount Tuam Special Management Area Resource Team (SMART). As a whole, this area faces the same external threats including off-road vehicle traffic, overgrazing, and conifer encroachment associated with fire suppression.

Figure 1. Location of Cyril Cunningham Nature Reserve in relation to surrounding Gulf Islands

Figure 2. Location of Cyril Cunningham Nature Reserve in relation to surrounding properties

2.4 Adjacent Land Use and Connectivity

The Cyril Cunningham Nature Reserve is part of the Mount Tuam Special Management Area (boundary shown in Figure 4). A group of adjacent property owners and other stakeholders, collectively known as the Mt. Tuam Special Management Area Resource Team (SMART), work collaboratively to manage the ecological values on Mount Tuam, including Cyril Cunningham Nature Reserve. This group is guided by a Memorandum of Understanding as well as a Management and Restoration Plan (Maslovat 2011).

Figure 3. Location of Cyril Cunningham Nature Reserve in relation to surrounding protected areas

Directly north and west of the reserve is provincial crown land. Federal Crown land at the top of Mount Tuam is administered by Transport Canada and leased to Nav Canada for the operation of navigation equipment. Nav Canada subleases the site to telecommunication corporations, Rogers and Telus, for communication towers and the Victoria Airport Authority operates aviation beacons on this land. A conservation covenant on privately owned land, known as the Mt. Tuam Protected Area, protects 13.4 hectares near the summit of Mount Tuam.

Mount Tuam Ecological Reserve (administered by BC Parks) is to the east and west of the nature reserve. Trust Fund Board also holds a conservation covenant on the six private lots to the south of the Cyril Cunningham Nature Reserve, noted as the C. Cunningham Covenant in Figure 3.

The SMA is defined as follows:

> *"A SMA is an area defined by ecological boundaries rather than property lines in order to allow efficient and appropriate ecologically based management."* (Maslovat 2011).

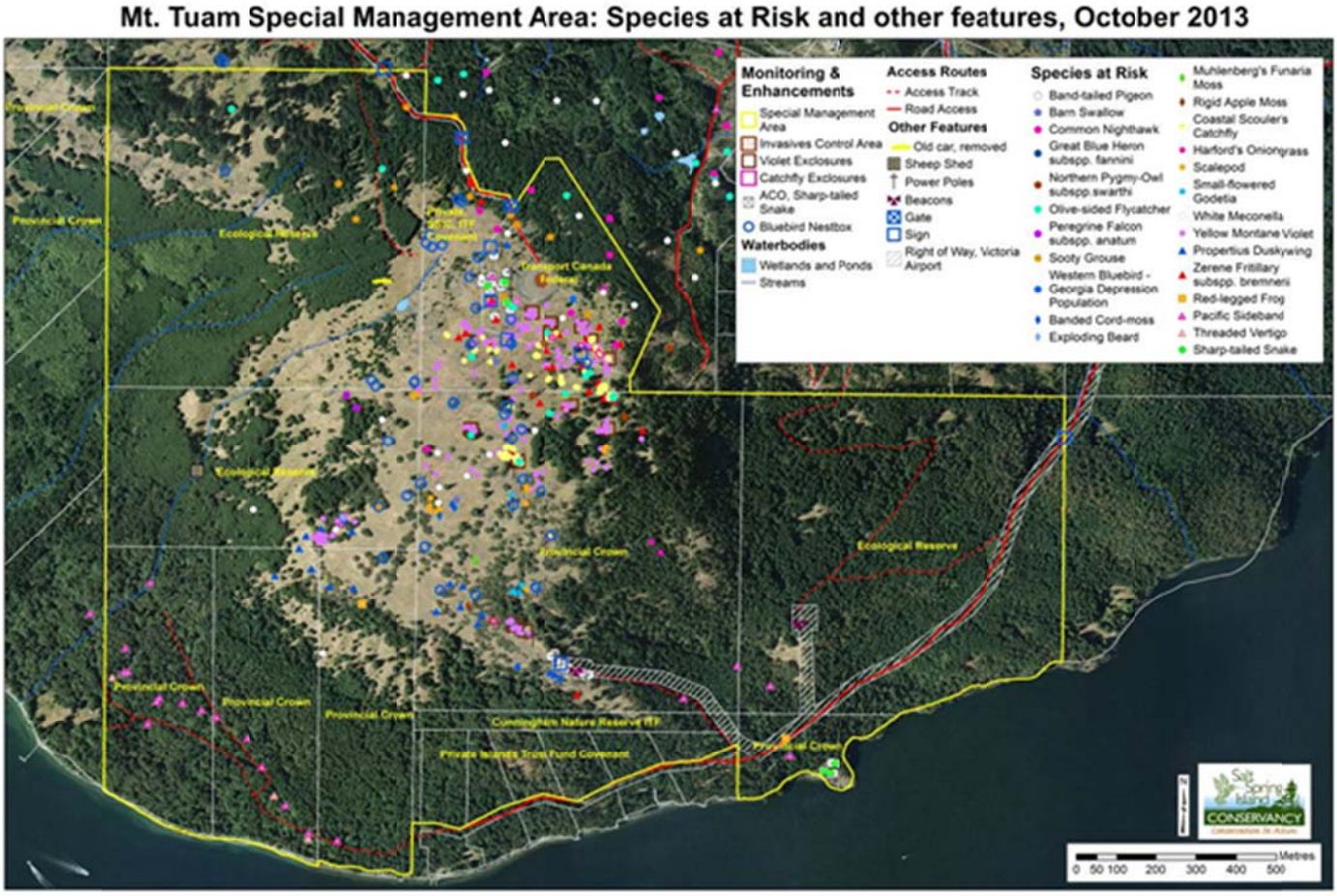

Figure 4. Mount Tuam Special Management Area (SMA), October 2013 Outline of SMA shown in yellow.

2.5 Site History

2.5.1 Pre-Contact

For over 10,000 years local First Nations have had an integral connection to the islands in the Trust area and the surrounding waters. “When the tide is out, the table is set” is an expression found in several of the local Indigenous languages that refers to one of many ways in which these resource-rich islands were used to feed and sustain their communities. There were places known for deer hunting, places for duck hunting, clam gardens that belonged to certain families, reef net fishing sites, special places for spiritual ceremonies, and so much more. The Island Trust Fund is committed to better understanding the First Nations’ connection to the land and water of the islands. Even though we are just beginning to understand the historical and current connection First Nations have with these islands, we are doing so with a sense of humility and sincerity in honouring those connections.

According to the BC Provincial Consultative Areas Database, Cyril Cunningham Nature Reserve is located within the asserted traditional territories of the following 13 First Nations and two treaty groups:

- Cowichan Tribes
- Halalt First Nation
- Lake Cowichan First Nation
- Lyackson First Nation
- Malahat First Nation
- Pauquachin First Nation
- Penelakut Tribe
- Semiahmoo First Nation
- Stz'uminus First Nation (Chemainus)
- Tsawwassen First Nation
- Tsartlip First Nation
- Tsawout First Nation
- Tseycum First Nation
- Te'Mexw Treaty Association
- Hul'qumi'num Treaty Group

It is likely that the site was used extensively by First Nations because Mount Tuam is known to be a significant place in terms of physical and spiritual power. Further communication is needed to better understand the traditional First Nation’s use of the reserve and the Mount Tuam area.

2.5.2 Previous Landowners

Mount Tuam first appears on a surveyor’s map in 1874 where it is described (along with adjacent Mount Bruce and Mount Sullivan) as “range of mountains 1000 to 2000 feet in

height suitable for sheep run" (Green, 1874). The area had a history of being used for free-ranging livestock until 2010 when adjacent landowners removed the majority of feral livestock (one feral goat and 45 sheep) from the open meadows on Mount Tuam. The few remaining sheep were removed in 2011.

The Cunningham family purchased the property which included what is now the Cyril Cunningham Nature Reserve in 1979-1980 and used it as a recreational property. Prior to that time, it was owned by Bob Akerman, who ranged sheep on the open meadows of Mount Tuam.

Cyril Cunningham Nature Reserve was transferred to the Islands Trust Fund Board (TFB) in 1994 by the Cunningham family and associates after the completion of approval to establish a subdivision on their Cape Keppel property. Cyril Cunningham Nature Reserve (Lot B) is approximately 15% of the original parcel, the remainder of which (Strata Lot A) was divided into Strata Lots 1-5, common property and a road link to each lot (map in Figure 2).

2.5.3 Forestry

From examining historic air photos, it is clear that the entire forested portion of the reserve, excluding Vegetation Type 3 (see Figure 6) was logged prior to 1953, probably at some time during the 1940s. Although a few isolated older Arbutus (*Arbutus menziesii*) and Douglas-fir (*Pseudotsuga menziesii*) trees remain, the vast majority of the forest is younger and there are stumps throughout the area.

There is an unusual stand of pure Arbutus. The shade intolerant Arbutus may be replaced by Douglas-fir which is present as seedlings in the understory. Over time, the area will return to a mature Coastal Douglas-fir forest with some variation in dominant tree species depending on soil depth and moisture.

2.6 Undersurface Rights

Undersurface rights for Cyril Cunningham Nature Reserve are not mentioned in the title.

2.7 Charges, Liens and Interests

2.7.1 Right of Way

A Right of Way was filed on the property on March 23, 1964 in favour of Her Majesty the Queen in Right of Canada (Land Title Office 1964). This Right of Way ensures access to a hazard beacon site north of the reserve. The Grantee may, *"…enter into and upon the said parcel or tract of land for the purposes of constructing and maintaining an access road for the purposes of constructing and maintaining an access road through the aforesaid hazard beacon site and for the purposes of erecting power and/or telephone poles and lines and of keeping and maintaining them at all times in good condition and repair…".*

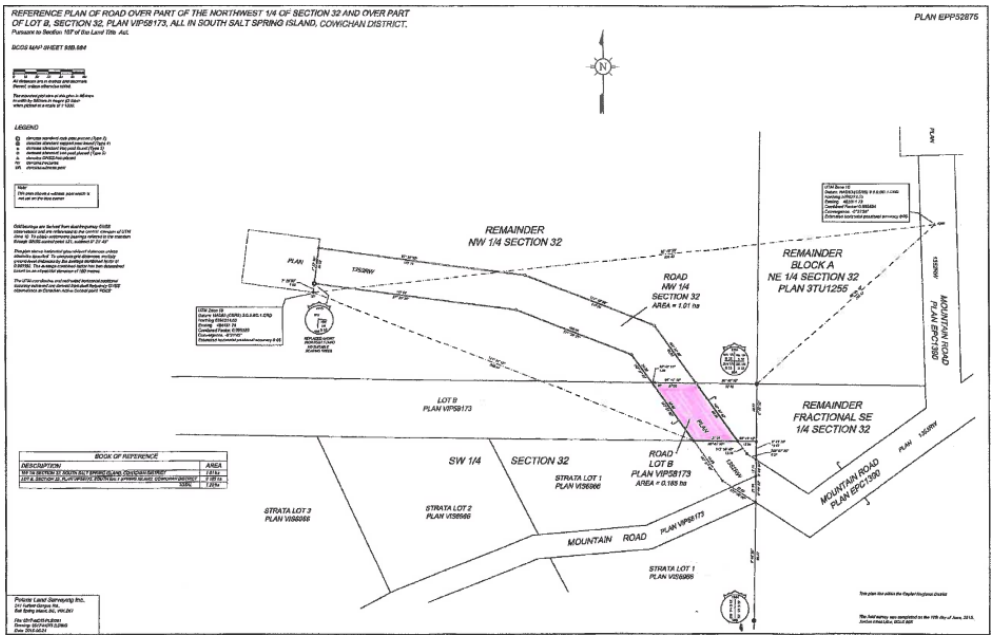

Figure 5. Survey of Right of Way over the Cyril Cunningham Nature Reserve

2.7.4 Conservation Covenant and Statutory Right of Way

A Section 219 Conservation Covenant and Section 218 Statutory Right of Way were registered on the Title on September 10th, 2014 in favor of the Salt Spring Island Conservancy and Habitat Acquisition Trust (Land Title Office 2014). The general intent of the Agreement is:

> *"a) to protect, preserve, conserve, maintain, enhance and, if applicable from time to time restore, the natural state of the Land and the Amenities as described in the Report; and*
> *b) to prevent any occupation or use of the Land that will impair or interfere with the natural state of the Land or the Amenities as described in the (Baseline) Report"*

According to Section 4.2, the owner must not:

> *"a) use or permit the use of the Land for an activity which:*
> - *i. causes or allows silts, leachates, fills or other deleterious substances to be released into any watercourse on the Land;*
> - *ii. causes the erosion of the Land to occur;*
> - *iii. causes or facilitates the loss of soil on the Land;*
> - *iv. alters or interferes with the hydrology of the Land, including by the diversion of natural drainage or flow of water in, on or through the Land;*
> - *v. causes or allows fill, rubbish, ashes, garbage, waste or other material foreign to the Land to be deposited in, on or under the Land;*

vi. causes or allows any component of the Land, including soil, gravel or rock, to be disturbed, explored for, moved, removed from or deposited in or on the Land;

vii. causes or allows pesticides, including but not limited to herbicides, insecticides or fungicides, to be applied to or introduced on the Land; or

viii. causes or allows any indigenous flora on the Land to be cut down, removed defoliated or in any way tampered with;

b) use the Land or allow the use of the Land for hunting, fishing, or gathering, or for the grazing of domestic animals;

c) construct, build, affix or place on the Land any buildings, structures, fixtures or improvements of any kind;

d) lay out or construct any new roads or paths on the Land;

e) use or permit the use of motorized vehicles on the Land, other than emergency vehicles;

f) permit firearms of any kind to be discharges in, on or over the Land;

g) subdivide the Land by any means; and

h) lease or license the Land or any part thereof unless the lease or license is expressly made subject to the provisions of this Agreement and expressly entitles the Owner to terminate the lease and license if the tenant or licensee breaches any of the provisions of this Agreement."

2.8 Official Community Plan

2.8.1 Zoning

In the Salt Spring Island Official Community Plan Bylaw No. 434, Cyril Cunningham Nature Reserve is designated Ecological Reserve (ER) in the OCP and zoned Parks and Reserves 6 (PR6).

2.8.2 Trail and Public Access

An unauthorized trail is used by the public to access the reserve in the eastern portion of the properties that traverses from Mountain Road to the open meadows of Mount Tuam. Within the reserve this trail runs through the utility corridor. This is not a legal access: the legal access to the reserve is west of Strata Lot 6 (see map in Figure 2).

This unauthorized trail is unmarked and used infrequently by hikers and off-road vehicles. The trail is very steep and slippery in many sections because of the high amount of Arbutus

leaf litter in the area. This trail is poorly designed and does not follow contours- it goes straight up the hill and is vulnerable to erosion.

Creating a trail to the reserve via the legal access from Mountain Road is impractical because the access is very steep and narrow and it will be very difficult to build a sustainable trail that will not be subject to erosion. For this reason, a formal trail network is not recommended. Informal use of the reserve will be monitored over time and managed as necessary.

2.8.3 Building and Other Infrastructure

There are no buildings in the reserve. Structures include the utilities described below and there is a page wire and t-post fence along the western boundary of the utility corridor right of way. The fence is standing in some locations and flat on the ground in other locations.

2.8.4 Utilities

A distribution power line occurs in the utility corridor in the eastern portion of the Reserve. There is one power pole in the reserve (see map in Figure 4). An old power pole that was replaced remains on the ground.

3.0 Ecological Inventory

3.1 Ecological Significance

Cyril Cunningham Nature Reserve includes mixed second-growth forests within the Coastal Douglas-fir biogeoclimatic zone. Historically, there was about 260,000 hectares which would have been classified as CDFmm (Ministry of Natural Resource Operations 2011). Unfortunately, much of this habitat has been destroyed by urban development, agriculture or logging: less than 1% of old growth in the CDFmm remains (CDFCP 2013). The forested areas of the reserve are a mix of Douglas-fir (*Pseudotsuga menziesii*), Arbutus (*Arbutus menziesii*) with some scattered Bigleaf Maple (*Acer macrophyllum*) and pockets of Western Redcedar (*Thuja plicata*) and Red Alder (*Alnus rubra*) on a steep, broad south facing slope. There is also a small portion of a Garry Oak rock outcrop dominated by mosses and herbaceous plants. There are a few very large veteran Douglas-fir and Arbutus trees as well as steep rocky cliffs within the reserve.

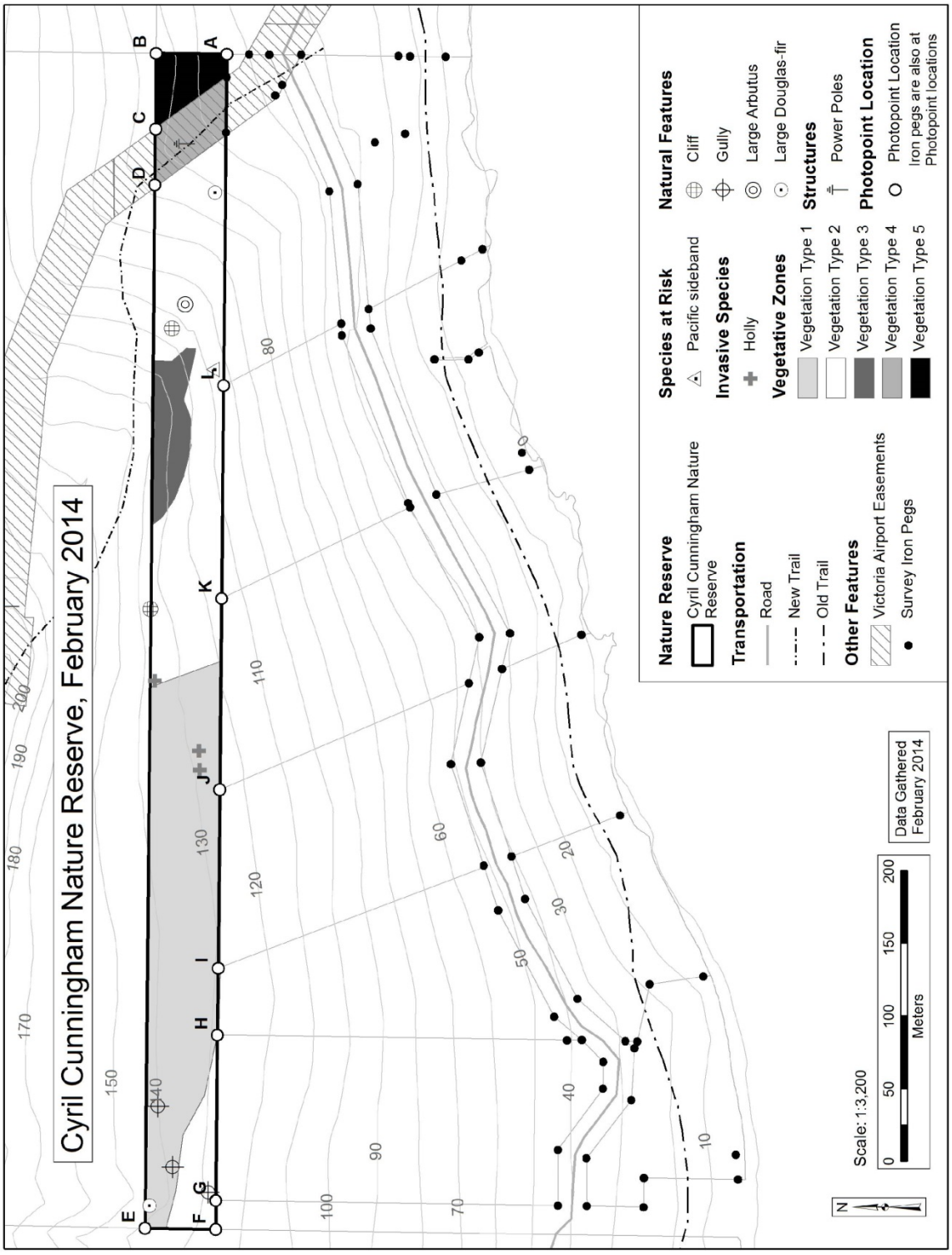

Figure 6. Cyril Cunningham Nature Reserve Vegetation types, Photopoints and Species at Risk

3.2 Climate

The rain shadow effect of the Olympic and Vancouver Island mountains and the moderating forces of the ocean are the dominant influences on the climate of Salt Spring Island. The island has a pattern of warm dry summers and mild wet winters.

The weather data from the closest station on Salt Spring Island is from Cusheon Lake. Climate normals from 1981 to 2010 at Cusheon Lake record an average of 169 frost free days per year with an average annual precipitation of 1071 mm. Almost 60% of the total annual precipitation falls during the winter months (November through February), with almost 9% falling as snow (Government of Canada 2016).

The months of December and January are the coldest, with daily average temperature of 2.4˚ and 2.8˚ Celsius, while July and August are the warmest months with mean temperatures of 16.1 and 16.2˚ Celsius (Government of Canada 2016). The combined effects of low precipitation, warm temperatures, and high number of sunshine hours often result in an annual moisture deficit on Salt Spring Island from mid-June to early October (Figure 7).

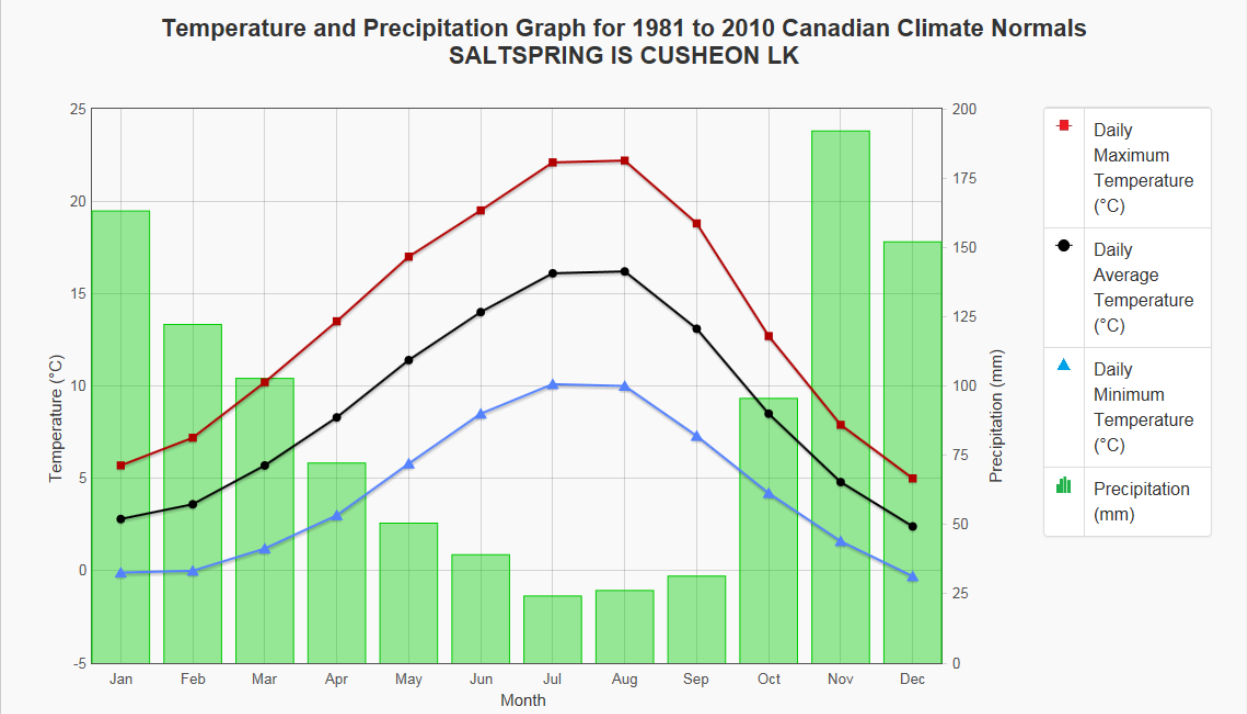

Figure 7. Temperature and Precipitation Normals (1981-2010) for Cusheon Lake Weather Station

3.3 Geology and Physiology

Salt Spring Island lies within the Nanaimo Basin, a large depression at the southern end of the Georgia Strait. Salt Spring Island is underlain predominantly by sedimentary rocks from the Nanaimo Group that date from the Upper Cretaceous and are composed of marine and

non-marine sediments deposited during five major periods (Van Vliet et al. 1987). On Mount Tuam and other areas south of the Fulford Valley, the bedrock is "Palaeozoic metamorphosed sedimentary rock belonging to the greywacke-argillite formation of the Sicker Group" (Van Vliet et al. 1987). Metamorphosed igneous and sedimentary rocks are more resistant to weathering than other rocks and have resulted in the high elevation mountains at the south end of Salt Spring Island (Van Vliet et al. 1987).

3.4 Hydrology

There are no water bodies on the reserve and the slope and well-drained soils result in no standing water.

3.5 Soils

According to the report, *Soils of the Gulf Islands of British Columbia: Volume 1* (Van Vliet *et al.* 1987), the soils in the Mount Tuam Protected Area are characterized by Rock-Musgrave (RO-MG). The dominant soil is rapid to well-drained and is described as:

> *"metamorphosed sedimentary bedrock exposed or covered by moss, or mineral soil less than 10 cm thick (Rock, 50-65%)".*

Greenwood and Mihalynuk (2011) classify Mount Tuam Protected Area soils as Mount Hall Gabbro sills (TrMg) and describe the soils as follows:

> *"Gabbro sills intrusive into Paleozoic strata. Tholeitic basalt with conspicuous glomerophorphyritic texture ("Flower Gabbro") especially along upper contacts. Similar textures have been observed in Karmutsen volcanic rocks. Local pockets of coarse grained hornblende pegmatite".*

3.6 Ecological Classification

Ecoprovince: Georgia Depression

Biogeoclimatic Units: The Reserve is situated within the Moist Maritime Subzone of the Coastal Douglas Fir (CDFmm) Biogeoclimatic Zone. Historically, there were about 260,000 hectares which would have been classified as CDFmm (Ministry of Natural Resource Operations 2011). Unfortunately, much of this habitat has been destroyed by urban development, agriculture or logging: less than 1% of old growth in the CDFmm remains (CDFCP 2013).

3.7 Ecological Plant Communities

An inventory of biological features was conducted in the Reserve on February 5th and 7th and March 3rd, 2014. Five ecological communities were identified and classified by Carrina Maslovat using *A Field Guide for Site Identification and Interpretation for the Vancouver Forest Region* (Green and Klinka, 1994) and the Guide for Non-Forested and Sparsely

Vegetated Ecosystems of the CDFmm (Government of BC, n. d.). (map in Figure 6). These ecological communities are described below.

Table 1. Red-listed Plant Communities Identified in Cyril Cunningham Nature Reserve

Ecological Community	Provincial Rank
Douglas-fir/Arbutus (CDFmm02)	Red List
Douglas-fir/Salal (CDFmm01)	Red List
Garry Oak/Brome(CDFmm00)	Red List
Western Redcedar/ Douglas-fir/Oregon Beaked Moss (CDFmm05)	Red List

3.7.1 Vegetation Type 1

Vegetation Type 1 is the **WD:bdDA5 (CDFmm02)** Woodland: broadleaf, Douglas-fir/Arbutus, Structural Stage 5 (Young forest) ecosystem type.

Vegetation Type 1 is dominated by a second growth Douglas-fir – Arbutus (CDFmm02) forest. This forest is unusual for this site series because the trees are almost exclusively Arbutus with only a very few scattered Douglas-fir. Slopes are moderately steep to steep with a south aspect. Soils are moderate to shallow, very well-drained with a few small rocky outcrops. This is a moderately open canopy, mid slope woodland with almost exclusively Arbutus trees. There is very little understory vegetation and the forest floor is covered with Arbutus leaf litter.

Table 2. Description of Ecological Community 1

FLORA

Main Canopy Species & percent cover **Arbutus** (*Arbutus menziesii*) (40%) Age (estimated) Height DBH **Douglas-fir** (*Pseudotsuga menziesii*) (3%) Age (estimated) Height DBH	**Red-listed Plant Community** 50-100 years 15-20m Up to 100cm 40-70 years 20m 25-60cm
Secondary Canopy Species & percent cover **Arbutus** (10%) Age (estimated) Height	 10-50 years 10-15m

DBH	20-25cm
Total Canopy Cover	50-60%
Understory (species & percent cover) Shrubs, including trees <10 m Herbs, ferns, grasses, mosses, etc.	10% Salal (*Gaultheria shallon*), 5% Douglas-fir seedlings, <1% Grand Fir (*Abies grandis*), <1% Dull Oregon-grape (*Mahonia nervosa*), <1% Orange Honeysuckle (*Lonicera ciliosa*), <1% Foxglove* (*Digitalis purpurea*), <1% Oregon Beaked-moss (*Eurhynchium oreganum*) Some scattered English Holly* (*Ilex aquifolium*) present. Species on rocky knolls include (% cover not taken): Common Vetch* (*Vicia sativa*), Blue Wildrye (*Elymus glaucus*), Wallace's Selaginella (*Selaginella wallacei*), Hedgehog Dogtail* (*Cynosurus echinatus*), Dovefoot Geranium* (*Geranium molle*), Upright Hedge-parsley*(*Torilis arvense*), Small-flowered Woodlandstar (*Lithophragma parviflora*), Little Western Bittercress (*Cardamine oligosperma*), Wild Carrot (*Daucus carota*), Tarweed (*Madia* sp.), Great Mullein* (*Verbascum thpsus*), Juniper Haircap Moss (*Polytrichum juniperinum*), and Rock-moss (*Racomitrium* sp.)
Observed rare/threatened species & locally uncommon species	None
Potential Other Species at Risk	None likely
Special Features	Arbutus dominated forest. Large old Douglas-fir in northwest corner of covenant area (Photo in Appendix D). Series of steep gullies in the western portion of Vegetation Type.
Expected Changes	There are many small Douglas-fir seedlings in the understory. Eventually, the forest type may change to a Douglas-fir dominated forest as these seedlings mature and eventually shade out the Arbutus. Possibility of some limited erosion in steep gullies with heavy rainfall events. Erosion may lead to increased windthrow in these areas.
Disturbance History	Large Douglas-fir stumps throughout the Vegetation Type evidence of historic logging. Many of the stumps have fire scars, evidence of a wildfire at some point in the past.

*Indicates a non-native species

FAUNA

Wildlife Habitat / Features	Large old Douglas-fir in northwest corner of Covenant Area provides avian perch sites and may have nesting cavities. Arbutus berries provide seasonal food for birds. Very limited diversity of understory vegetation.
Observed Species	Black-tailed Deer (*Odocoileus hemionus*) scat, Pacific Wren (*Troglodytes pacificus*) observed
Observed rare/threatened species	None
Potential Other Species at Risk	Band-tailed Pigeon (*Patagioenas fasciata*) Western Screech Owl (*Megascops kennicottii kennicottii*) Pacific Sideband Snail (*Monadenia fidelis*) (downgraded from blue listed to yellow listed in 2016)

3.7.2 Vegetation Type 2

Vegetation Type 2 is the **WD:mxDS5** (CDFmm01) Woodland: mixed, conifer and deciduous Douglas-fir/Salal, Structural Stage 5 (Young forest).

Vegetation Type 2 is dominated by a second growth Douglas-fir forest. The slopes are moderate to steep with a southern aspect. Soils are of moderate to shallow and well-drained. There are boulders and rocky cliff faces in the northern portion of this vegetation type where it borders Vegetation Type 3. This is a moderately open canopy, mid-lower slope woodland dominated by Arbutus and Douglas-fir with scattered Bigleaf Maple. There are some very large Arbutus and a few remnant Douglas-fir veterans that were not logged. There is a large amount of litter including leaves and coarse woody debris on the forest floor and the understory vegetation is sparse.

Table 3. Description of Ecological Community 2

FLORA

Main Canopy Species & percent cover **Douglas-fir** (*Pseudotsuga menziesii*) (35%)	**Red-listed Plant Community**
Age (estimated)	30-60 years (with a few old vets 100+ years)
Height	15-20m
DBH	25-60cm (older trees up to 125cm DBH)

Arbutus (*Arbutus menziesii*) 20%) Age (estimated) Height DBH	 30-60 years (with some old vets 100+ years) 15m 40-60cm (older trees up to 160cm DBH)
Secondary Canopy Species & percent cover **Douglas-fir** (5%) Age (estimated) Height DBH **Bigleaf Maple** (*Acer macrophyllum*) (1%) Age (estimated) Height DBH **Western Flowering Dogwood** (*Cornus nuttallii*) (<1%) Age (estimated) Height DBH	 15-20 years 10m 10-25cm 75-100 years 15-20m Up to 110cm 30-50 years 10m 30cm
Total Canopy Cover	60%
Understory (species & percent cover) Shrubs, including trees <10 m Herbs, ferns, grasses, mosses, etc.	2% Salal (*Gaultheria shallon*), 2% Dull Oregon-grape (*Mahonia nervosa*), <1% Sword Fern (*Polystichum munitum*), <1% Hairy honeysuckle (*Lonicera hispidula*), <1% Small-flowered Nemophila (*Nemophila parviflora*), <1% Oregon Beaked-moss (*Eurhynchium oreganum*).
Observed rare/threatened species & locally uncommon species	Uncommon species: Western Flowering Dogwood
Potential Other Species at Risk	None expected
Special Features	Cliff and rock outcrops Gully in western portion of Covenant Area Large old Douglas-fir trees Large old Arbutus
Expected Changes	Forest will gradually mature and become more complex as gaps open and trees age.
Disturbance History	Old Douglas-fir stumps throughout. Fire scars on the old stumps. Some scattered windthrow.

FAUNA

Wildlife Habitat / Features	Large old Douglas-fir and old Arbutus provide perch sites and may have nesting cavities. Rocky outcrop may provide habitat for reptiles and

	gastropods. Arbutus berries provide seasonal food for birds. Very limited diversity of understory vegetation.
Observed Species	Pacific wren (*Troglodytes pacificus*), Red Squirrel (*Tamiasciurus hudsonicus*), Black-tailed Deer (*Odocoileus hemionus*) observed. Unidentified scat with shells, possibly Raccoon (*Procyon lotor*) or River Otter (*Lontra canadensis*) Sapsucker holes (likely *Sphyrapicus ruber*) in Arbutus trees
Observed rare/threatened species	Pacific Sideband Snail (*Monadenia fidelis*)) (downgraded from blue listed to yellow listed in 2016)
Potential Other Species at Risk	Western Screech Owl (*Megascops kennicottii kennicottii*) Band-tailed Pigeon (*Patagioenas fasciata*) Sooty Grouse (*Dendragapus fuliginosus*) (downgraded from blue listed to yellow listed in 2016) Peacock Vinyl lichen (*Leptogium polycarpum*)

3.7.3 Vegetation Type 3

Vegetation Type 3 is WD: bdQB5 (CDFmm00) Woodland: broadleaf Garry Oak/ Brome, Structural Stage 5 (Young Forest).

Vegetation Type 3 is an open, thin soil rocky outcrop with a few scattered young Garry Oak (*Quercus garryana*) trees. The understory consists of a diverse mix of species, predominantly grasses, a large number of which are non-native. Mosses are dominant in over rock outcrops. Soils are thin and nutrient poor. The site is south facing and occurs at the bottom of a very large open meadow.

Table 4. Description of Ecological Community 3

FLORA

Main Canopy Species & percent cover **Garry Oak** (*Quercus garryana*) (3%) Age (estimated) Height DBH **Arbutus** (*Arbutus menziesii*) (1%) Age (estimated)	**Red-listed Plant Community** 20-50 years 8m 15-25cm 50-100 years

Height DBH **Douglas-fir** (*Pseudotsuga menziesii*) (1%) Age (estimated) Height DBH	15m 40-90cm 15-20 years (Large veteran Douglas-fir much older) 10m 30cm (Older veteran Douglas-fir with 150cm DBH)
Total Canopy Cover	5%
Understory (species & percent cover) Shrubs, including trees <10 m Herbs, ferns, grasses, mosses, etc.	20% Sweet Vernalgrass* (*Anthoxanthum odoratum*), 10% Upright Hedge-parsley*(*Torilis arvense*), 10% Brome* (*Bromus* sp.), 5% Hedgehog Dogtail* (*Cynosurus echinatus*), 5% Blue Wildrye (*Elymus glaucus*), 3% Great Mullein* (*Verbascum thpsus*), 2% Dovefoot Geranium* (*Geranium molle*), 1% Roemer's Fescue (*Festuca roemeri*), 1% Hairy Cat's-ear* (*Hypochaeris radicata*), <1% Claytonia (*Claytonia* sp.), <1% Wallace's Selaginella (*Selaginella wallacei*), <1% California Brome (*Bromus sitchensis*), <1% Hairy Honeysuckle (*Lonicera hispidula*), <1% Long-stolon Sedge (*Carex inops*), <1% Pacific Sanicle (*Sanicula crassicaulis*), <1% Common Stork's-bill* (*Erodium cicutarium*), <1% Broad-leaved Stonecrop (*Sedum spathulifolium*), <1% Field Parsley Piert* (*Aphanes arvensis*), <1% Small-flowered Woodlandstar (*Lithophragma parviflora*), <1% Tall Oregon-grape (*Mahonia aquifolium*), <1% White Triteleia (*Triteleia hyacinthina*) and thin-soil rock outcrops 40% with a cover of mosses including Juniper Haircap Moss (*Polytrichum juniperinum*), Rock-moss (*Racomitrium* sp.) and Dicranum (*Dicranum* sp.)
Observed rare/threatened species & locally uncommon species	None
Potential Other Species at Risk	Small possibility of rare species associated with Garry Oak ecosystems. For example, Yellow Montane Violet (*Viola praemorsa* ssp. *praemorsa*) occurs on the property to the north and there is a slight possibility it may occur in the Covenant Area.
Special Features	Garry oak meadow on rock outcrop
Expected Changes	Soils are very thin and will likely prevent the conifer encroachment associated with fire suppression. However, some conifers may establish in the deeper soil pockets.

Disturbance History	Sheep were grazed in the open meadow areas of Mount Tuam, possibly as early as the late 1800s. Fire scars on large Douglas-fir veteran tree.

*Indicates non-native species

FAUNA

Wildlife Habitat / Features	Large Douglas-fir provides perch sites and may have cavities for nesting. Open grassy meadows provide habitat for small mammals such as voles. Open meadows provide good hunting sites for raptors.
Observed Species	Black-tailed Deer (*Odocoileus hemionus*) scat observed
Observed rare/threatened species	None
Potential Other Species at Risk	Propertius Duskywing (*Erynnis propertius*), Sharp-tailed Snake (*Contia tenuis*)

3.7.4 Vegetation Type 4

Vegetation Type 4 is **WD: coYFDS5 (CDF mm01)** Woodland: conifer dominated, Douglas-fir/Salal, Structural Stage 5 (Young Forest)

Vegetation Type 4 is highly modified due to the regular tree and brush removal done to maintain the power lines through the utility corridor in the eastern part of the Covenant Area. Mature trees occur only at the edges of the corridor and are composed of a mix of Douglas-fir (*Pseudotsuga menziesii*) and Arbutus (*Arbutus menziesii*) with younger Western Redcedar (*Thuja plicata*), Red Alder (*Alnus rubra*) and Bigleaf Maple (*Acer macrophyllum*). Slopes are moderately steep with a southern aspect. Soils are moderate, well-drained, and of poor to medium richness. This is an open, lower-slope site with a relatively diverse understory including a dense shrub cover. The herbaceous vegetation is dominated by non-native invasive forbs and grasses.

Table 5. Description of Ecological Community 4

FLORA

Main Canopy Species & percent cover **Douglas-fir** (*Pseudotsuga menziesii*) (20%) Age (estimated)	All mature trees occur at the edges of the vegetation type since the central corridor is regularly cleared to maintain the power line. 30-50 years

Height DBH **Arbutus** (*Arbutus menziesii*) (3%) Age (estimated) Height DBH	20m 15-80cm 40-60 years 15m 30cm
Secondary Canopy Species & percent cover **Western Redcedar** (*Thuja plicata*) (2%) Age (estimated) Height DBH **Red Alder** (*Alnus rubra*) (1%) Age (estimated) Height DBH **Bigleaf Maple** (*Acer macrophyllum*) (1%) Age (estimated) Height DBH	 20-60 years 15m 30-90cm 20-40 years 15m 40-60cm 20-40 years 15m 75cm
Total Canopy Cover	25%
Understory (species & percent cover) Shrubs, including trees <10 m Herbs, ferns, grasses, mosses, etc.	50% Salal (*Gaultheria shallon*), 10% Douglas-fir seedlings, 5% Dull Oregon-grape (*Mahonia nervosa*), 3% Foxglove* (*Digitalis purpurea*), 2% Western Redcedar seedlings, 2% Blue Wildrye (*Elymus glaucus*), 1% Sword Fern (*Polystichum munitum*), 1% Bull Thistle* (*Cirsium vulgare*), <1% Baldhip Rose (*Rosa gymnocarpa*), <1% California Brome (*Bromus carinatus*), <1% Orchard Grass* (*Dactylis glomerata*), <1% Pacific Sanicle (*Sanicula crassicaulis*), <1% Little Western Bittercress (*Cardamine oligosperma*), <1% Common Vetch* (*Vicia sativa*), <1% Common Stork's-bill* (*Erodium cicutarium*), <1% Tarweed (*Madia* sp.), <1% Hairy Cat's Ear* (*Hypochaeris radicata*), <1% Wall Lettuce* (*Mycelis muralis*), <1% Common Chickweed* (*Stellaria media*), <1% Yerba Buena (*Clinopodium douglasii*), <1% Oregon Beaked-moss (*Eurhynchium oreganum*)
Observed rare/threatened species	None

& locally uncommon species	
Potential Other Species at Risk	None likely
Special Features	Regularly cleared utility corridor
Expected Changes	Ongoing tree and shrub removal to maintain power line. There may be further future invasion of non-native species because of the regular disturbance. For example, there is currently no Scotch Broom (*Cytisus scoparius*) and if allowed to establish, it will spread through this disturbed area.
Disturbance History	Regular tree and shrub removal through the central corridor for maintenance of power line. May be erosion along hiking trail due to steepness.

FAUNA

Wildlife Habitat / Features	Open cleared area.
Observed Species	Pacific wren (*Troglodytes pacificus*) observed, Black-tailed Deer (*Odocoileus hemionus*) scat observed.
Observed rare/threatened species	None
Potential Other Species at Risk	None likely

3.7.5 Vegetation Type 5

Vegetation Type 5 is WD: coYFRK5 (CDFmm05)
Woodland: conifer dominated, Western Redcedar/Douglas-fir/Oregon Beaked Moss, Structural Stage 5 (Young Forest)

Vegetation Type 5 is a conifer dominated, older second growth Western Redcedar (*Thuja plicata*) Douglas-fir (*Pseudotsuga menziesii*) forest. Slopes are moderate with a southern aspect. Soils are well-drained, and of poor to medium richness. This is a moderately closed canopy, lower-slope forested site dominated by Western Redcedar and Douglas-fir with isolated Big-leaf Maple (*Acer macrophyllum*) and Red Alder (*Alnus rubra*) trees. There is a relatively dense secondary canopy of Western Redcedar. The understory is very sparse.

Table 6. Description of Ecological Community 5

FLORA

Main Canopy Species & percent cover **Western Redcedar** (*Thuja plicata*) (40%) Age (estimated)	**Red-listed Ecological Community** 50-75 years (some may be as old as 100 years)

Height DBH **Douglas-fir** (*Pseudotsuga menziesii*) (15%) Age (estimated) Height DBH	15-25m 75-100cm 50-70 years 15-25m 30-60cm
Secondary Canopy Species & percent cover **Red Alder** (*Alnus rubra*) (2%) Age (estimated) Height DBH **Western Redcedar** (10%) Age (estimated) Height DBH **Bigleaf Maple** (*Acer macrophyllum*) (2%) Age (estimated) Height DBH	 20-30 years 10m 50cm 10-20 years 7-10m 10-15cm 20-50 years 15m 40cm
Total Canopy Cover	70%
Understory (species & percent cover) Shrubs, including trees <10 m Herbs, ferns, grasses, mosses, etc.	There is very little understory with most of the groundcover consisting of needle fall from Western Redcedar. There is some scattered (1%) Salal (*Gaultheria shallon*) along the boundary of Vegetation Type 4.
Observed rare/threatened species & locally uncommon species	None observed
Potential Other Species at Risk	None likely
Special Features	None observed
Expected Changes	There is some self-thinning of the stand as some of smaller Western Redcedar trees in the understory are dying as they are shaded out. This may continue in the future. With ongoing brushing of the adjacent powerlines, there may be more windthrow with extreme climatic events.
Disturbance History	There are large Douglas-fir stumps from when the site was previously logged. There is some limited older windthrow of smaller trees.

FAUNA

Wildlife Habitat / Features	
Observed Species	American Robin (*Turdus migratorius*) observed, Black-tailed Deer (*Odocoileus hemionus*) scat observed
Observed rare/threatened species	None
Potential Other Species at Risk	Pacific Sideband (*Monadenia fidelis*) (downgraded from blue listed to yellow listed in 2016) Sooty Grouse (*Dendragapus fuliginosus*) (downgraded from blue listed to yellow listed in 2016) Threaded Vertigo (*Nearctula spp. 1*)

3.8 Wildlife Species

Many different wildlife species use Cyril Cunningham Nature Reserve. Large old Douglas-fir and old Arbutus provide perch sites and may have cavities for nesting. Arbutus berries also provide seasonal food for birds. Open grassy meadows provide habitat for small mammals such as voles and good hunting sites for raptors. Rocky outcrop provide habitat for reptiles and gastropods, including Pacific Sideband (*Monadenia fidelis*) and potentially Sharp-tailed Snake (*Contia tenuis*).

Black-tailed Deer (*Odocoileus hemionus columbianus*), Red Squirrel (*Tamiasciurus hudsonicus*), and scat from North America River Otter (*Lontra canadensis*) or possibly Raccoon (*Procyon lotor*) were observed during the preparation of the baseline inventory. Sooty Grouse (*Dendragapus fuliginosus*), Pacific Wren (*Troglodytes pacificus)* and American Robin (*Turdus migratorius*) were observed as were sapsucker holes (likely Red-breasted Sapsucker (*Sphyrapicus ruber*) in a number of the Arbutus trees.

3.9 Red and Blue Listed Species

Pacific Sideband Snail (*Monadenia fidelis*) was blue-listed at the time of the baseline inventory, in March 2014, and is documented as such in the conservation covenant, September 2014, but in 2016 was downgraded from blue listed to yellow listed. Biologist Laura Matthias identified leafless wintergreen (*Pyrola aphylla)* in the reserve in 2016. A full survey looking specifically for Species at Risk has not yet been completed for the reserve so future findings are likely.

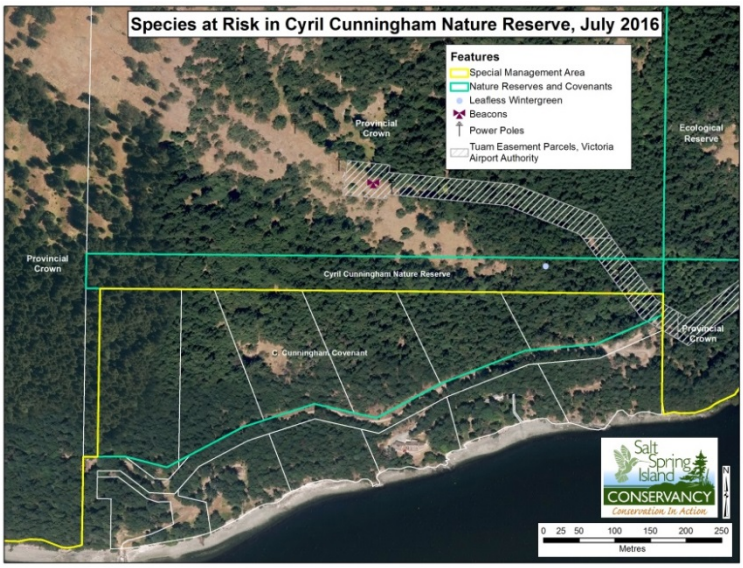

Photo 1. Leafless wintergreen (Photo L. Matthias)

Table 7. Species at Risk Identified to Date in Cyril Cunningham Nature Reserve

Species Common Name	Species Latin Name	Provincial Rank[3]	COSEWIC Rank[4]	SARA Status	Global
leafless wintergreen	*Pyrola aphylla*	Blue List (S2S3) 2015			Unranked, Global Rank not yet assessed

4.0 Threats

4.1 Non-native Invasive Species

There are a few invasive non-native shrubs in the reserve but they are currently few in number and do not appear to be spreading rapidly. There are three small isolated patches of English holly in Vegetation Type 2 (Figure 6). This invasive shrub is very difficult to control without herbicides because it readily re-sprouts from cut stems and can also produce shoots from the roots if the stem is cut. Cutting the stem results in vigorous new growth and control should only be started if it is possible to cut the regrowth regularly (i.e. once per week during the growing season) or remove the root mass. A possible tactic to kill holly is to severely fray the stem with an axe or other tool repeatedly over a few years.

There are large numbers of non-native grasses and forbs in both Vegetation Type 3 in the

[3] BC Conservation Data Centre (BC CDC 2016)
[4] Committee on the Status of Endangered Wildlife in Canada (Government of Canada 2016b)

Garry Oak meadow and Vegetation Type 4 under the power lines in the utility corridor (see map in Figure 6).

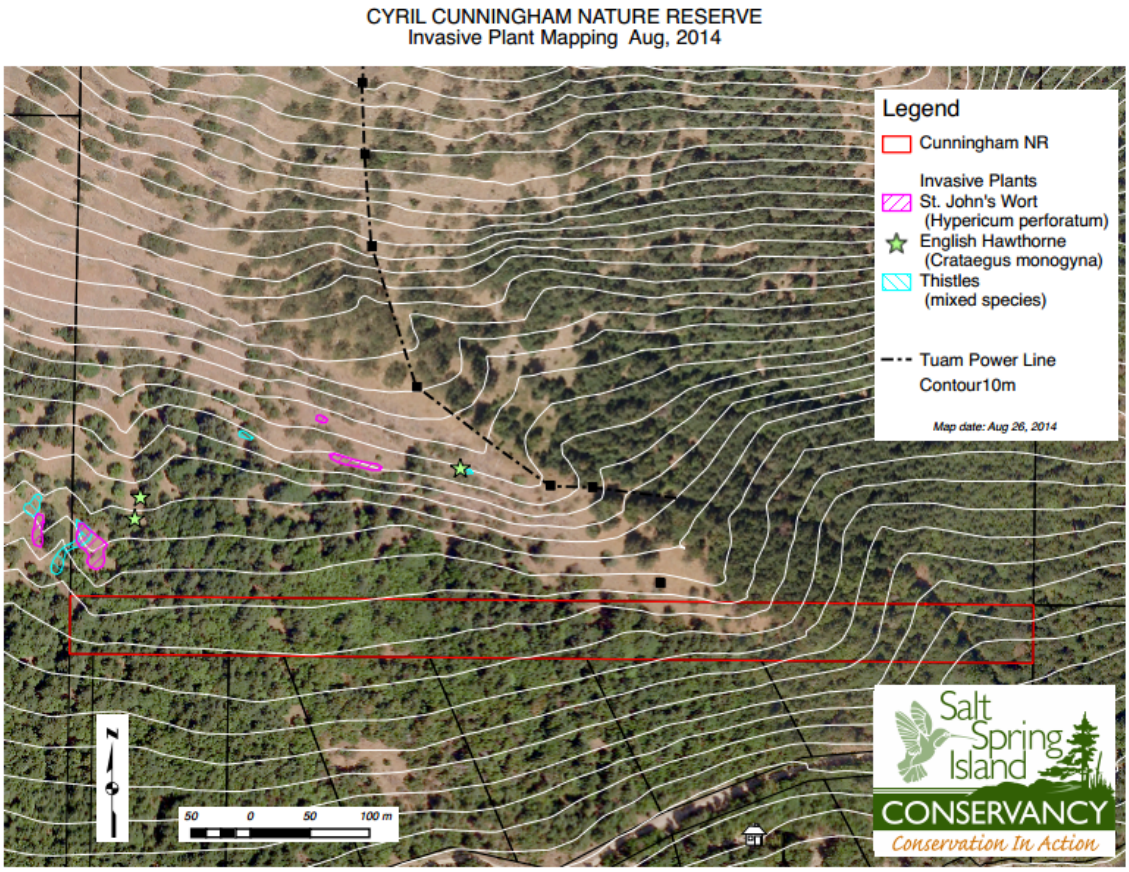

Figure 8. Invasive plant mapping Credit: Salt Spring Island Conservancy

To date, there are no effective management strategies for addressing invasive grasses and forbs and any potential management is very labour intensive. Research of ongoing studies as to how to better deal with these non-natives will be reviewed over the life of this plan.

There is currently no Scotch Broom (*Cytisus scoparius*), English hawthorn (*Crataegus monogyna*) or Gorse (*Ulex europaeus*) on the reserve, even in the areas regularly disturbed in the utility corridor. There is a single isolated Cotoneaster (*Cotoneaster sp.*) and Briar Rose (*Rosa eglanteria*) plant in the Cunningham Covenant to the south. Both of these invasive shrubs also resprout from cut stems. There is a small patch of Scotch Broom (*Cytisus scoparius*) in the provincial crown property to the north which is cut annually by the Salt Spring Island Conservancy as funding allows (see map in Figure 8). There are also scattered English hawthorn (*Crateagus monogyna*) in the provincial Crown lands. There should be ongoing monitoring and management of priority invasive species to limit their spread into the reserve.

4.2 Off-road Vehicle Use

People on off-road trials bikes[5] are known to traverse Mount Tuam from the summit to the bottom using the trail that cuts through the reserve under the power line in the utility corridor. It is not known if people on ATVs also use this trail, but their tracks have been observed at the summit of Mount Tuam. Off-road vehicle use not only increases erosion and damages plants and their habitat, but the soil disturbance also facilitates invasion by exotic species which compete with native species for water, nutrients, light and space. Off road use can also result in mortalities to wildlife and Species at Risk, such as Sharp-tailed Snakes, or ground-nesting Common Nighthawks.

4.3 Trails

Hikers do infrequently hike on Mount Tuam and access the open meadows further up the mountain via the trail through the reserve. This is an unofficial hiking trail used by the Salt Spring Island Trail and Nature Club and neighbours who live in the Mountain Road area. This trail leads from Mountain Road through the open meadows to the summit of Mount Tuam. This trail is extremely steep and has not been designed to follow the contours. There is little evidence of impacts from the current level of use, but if use increases, erosion and an increase in invasive species may occur.

4.4 Overgrazing

Feral sheep were once common on Mount Tuam and historically would have grazed in the reserve. Sheep grazing may have started in the late 1800s. Bob Akerman (the owner prior to the Cunninghams) is reported to have had as many as 1000 sheep which he grazed in the open meadows of Mount Tuam (as stated in previous reserve management plan). In 2009, 45 sheep and 1 goat were removed from the upper meadows of Mount Tuam (Linton pers. comm. 2010). A small number of feral sheep (4 ewes and 3 lambs) were observed in the spring of 2011 (Maslovat pers. obs. 2011).

Although feral livestock have not been recently observed on Mount Tuam, there is still considerable grazing pressure from native Black-tailed Deer (*Odocoileus hemionus columbianus*). Currently, levels of deer are extremely high because of recent declines in hunting, the eradication of predators and the fragmentation of habitat. There was much evidence of browsing in the reserve. Eastern Cottontail Rabbits (*Sylvilagus floridanus*) were first observed near the summit of Mount Tuam in 2012 and are expected to spread down the mountain to the reserve in the future. Their impact is unknown.

The greatest impact from overgrazing is to Vegetation Type 3 (see Figure 6). The feral sheep, which have been removed, may have shifted the vegetation of the reserve to those species that are less palatable to the sheep.

[5] Trials bikes are lightweight, motorized bikes with soft tires. They are designed to go off road over obstacles.

4.5 Wildfire

Prior to European settlement, fires burned throughout Mount Tuam, as evidenced by fire scars on the few remaining older Douglas-fir (*Pseudotsuga menziesii*) trees and on stumps in the reserve. Although the fire return interval for Mount Tuam is not known, charcoal analysis suggests fires in Garry Oak (*Quercus garryana*) ecosystems occurred on average every 26 to 40 years prior to 1880 (Pellatt et al. 2007). This research would not capture low intensity fires set by First Nations (Pellatt et al. 2007). All fires have been actively suppressed since European settlement (Pellatt et al. 2007).

Naturally occurring fires have been actively suppressed for approximately a century on Salt Spring Island. Fire suppression in forested areas creates elevated fuel levels that are much higher than during pre-European contact. If fires do occur in the reserve they would likely be hotter than historic fires and may be more damaging than historic fires. Fire suppression coupled with livestock removal may allow conifer encroachment into the small open meadow area of Vegetation Type 3 (see Figure 6), altering light levels and changing biological structure. However, much of the meadow has extremely thin soils which will preclude conifer growth.

Human activity on Mount Tuam may also increase the risk of fire.

4.6 Utility Line Maintenance

Ongoing maintenance of the utility lines removes established trees and shrubs. This process creates disturbance, facilitating the invasion by non-native species and alters the natural structure of the vegetation community.

4.7 Erosion

Some portions of the reserve are extremely steep and there is the potential for erosion to occur with extreme weather events that create windthrow or heavy rainfall. In particular, the deep gullies in the western portion of the reserve (Vegetation Type 1 and 2, Figure 6) and along the trail (Vegetation Type 4, Figure 6) may suffer from erosion. The cliffs below the grasslands may also be vulnerable to erosion. However, the area is well vegetated and there is little potential for erosion unless land use changes dramatically either on the reserve or upslope.

The most vulnerable location for erosion is next to the hiking trail which follows close to the utility corridor. The trail is a desired line route that does not follow the contours but goes straight up the hill. There is some erosion occurring in the Cunningham Covenant to the south where water flow has carried sediment downhill. Further erosion may occur on the trail bed and next to the trail, especially if use by hikers and/or off-road vehicles increases.

4.8 Expected Change over Time

In the Arbutus dominated forests, Douglas-fir seedlings may eventually overtop the shade-intolerant Arbutus. Barring any land use changes upslope, an increase in the number of invasive species or erosion over time is not expected.

5.0 Stakeholder Consultation

5.1 Adjacent Landowners

The Islands Trust Fund undertook a limited public consultation process as part of the development of this management plan. Eight adjacent landowners, within 100 metres of the nature reserve, were mailed a letter with an accompanying questionnaire (questionnaire included in Appendix G) to inform them that a revision of the existing management plan was in development for the reserve and to ask them to complete the questionnaire so that they could share their thoughts on the broad-scale management concerns of the reserve. Four neighbours replied with a complete questionnaire.

5.2 First Nations

A letter was sent to all of the 13 First Nations and two treaty groups who have asserted traditional territories that include Cyril Cunningham Nature Reserve (letter included in Appendix H). The letter informed First Nations that a management plan was being prepared and asked for input related to broad-scale management concerns. At the date of the plan approval there has been one response from the Cowichan Tribes, but the Islands Trust Fund remains open to communication throughout the life of this management plan.

5.3 Conservation Partners

The members of the Special Management Area Resource Team (SMART) were invited to comment via questionnaire and at the June 1, 2016 meeting at the Blackburn Lake Nature Reserve facility. Three questionnaires were returned. The two holders of the conservation covenant, the Salt Spring Island Conservancy and Habitat Acquisition Trust also responded to the questionnaire.

5.4 Consultation Results

The concerns and information highlighted in all the responses have been addressed in this plan. The questionnaires asked respondents what the top three “most important values nature reserves offer”, the results were:

1. Conservation for the sake of the intrinsic value of nature
2. Protection of habitat for at-risk species
3. Ecosystem services (e.g. clean water and air, erosion control, groundwater recharge, etc.)

The consultation process revealed that the community in general was concerned about the following management issues:

- Motorized vehicles
- Mountain bikes
- Horse use
- Invasive species invasion
- Fire
- Camping
- Collecting firewood
- Erosion
- Hunting

6.0 Management Plan

6.1 Vision

That the unique ecological values of Cyril Cunningham Nature Reserve will be protected in perpetuity in order to support a diverse range of native plants and animals.

6.2 Discussion

The purpose of Cyril Cunningham Nature Reserve is to protect the ecological integrity of the land in accordance with the objectives of the ITF. Ongoing monitoring and management is required in order to ensure that ecosystems and species continue to remain protected from threats. All management activities within the protected area must consider the specific sensitivities of the Species at Risk and their habitat found to date on the property and any additional Species at Risk found in the future.

In this section several key areas of the management planning process are identified and recommendations are formulated to achieve the vision, purpose and objectives for Cyril Cunningham Nature Reserve.

6.3 Management of the Reserve

The management of the reserve will depend on a collaborative effort between the Islands Trust Fund and Salt Spring Island Conservancy and Habitat Acquisition Trust, co-holders of the conservation covenant on the reserve.

6.4 Permitted and Prohibited Uses

The sensitive natural features of the reserve include thin soil rock outcrops with delicate moss mats and meadow vegetation. These areas are easily disturbed by hikers and off-road vehicles. Other features such as older trees, gullies and rock cliffs are unlikely to be impacted by the current level of activities within the reserve. Wildfire is also a major concern with risk increasing with human use.

Recommended permitted uses include:

- Scientific research, provided permission is received from TFB and both covenant holders
- Activities associated with the management and monitoring of the property

The following activities by the public are prohibited:

- Use of motorized vehicles
- Bicycling
- Horseback riding
- Camping
- Fires
- Forestry
- Livestock grazing
- Tree cutting
- Collection of plants or animals

6.5 Public Access

There is legal access to the reserve for the TFB and the covenant holders west of Strata Lot 6, but there is currently no public access to the reserve.

People do access the reserve via a trail in the eastern portion of the properties that traverses from Mountain Road to the open meadows of Mount Tuam, but this is not a legal access. Within the reserve the trail is within the utility corridor. This trail is unmarked and used infrequently by hikers and off-road vehicles. The trail is very steep and slippery in many sections because of the high amount of Arbutus leaf litter in the area. This trail is poorly designed and does not follow contours; it goes straight up the hill and is vulnerable to erosion.

Recommendation

Creating a trail to the reserve via the legal access from Mountain Road is impractical because the access is very steep and narrow and it will be very difficult to build a sustainable trail that will not be subject to erosion. For this reason, a formal trail network is not recommended. Informal use of reserve will be monitored over time and managed as necessary.

6.6 Signage

There is currently no signage on the reserve.

Recommendation

That ITF install a sign at the property boundary, on the southeast corner where anyone accessing the reserve from Mountain Road would see it, that identifies the property as a protected area and outlines prohibited uses of the reserve.

6.7 Protection initiatives for Sensitive Ecosystems and Species at Risk

The four red-listed plant communities, as well as the blue-listed leafless wintergreen (*Pyrola aphylla*) identified in Cyril Cunningham Nature Reserve to date should be monitored closely with the proper management protocol considered from the most recent guidelines from federal and provincial authorities.

Recommendation

Monitor for evidence of feral sheep and the impacts of grazing by Black-tailed Deer (Odocoileus hemionus columbianus) and the potential spread of Eastern Cottontail Rabbits (Sylvilagus floridanus) into the reserve.

6.7.1 Mount Tuam Special Management Area

The open meadow habitat found on Mount Tuam allows both Species at Risk and the threats facing them to readily cross property lines. In 2009/2010, a group of landowners and stakeholders met to discuss strategies for limiting off-road vehicle use on Mount Tuam. This group expanded and led to the creation of Mount Tuam Special Management Area (SMA, see Figure 4), a 400 hectares (988 acres) area of continuous protected and provincial lands.

The SMA is managed cooperatively by the Mount Tuam Special Management Resource Team (SMART) which includes landowners, land managers and other stakeholders. This group has been actively involved in the following management activities that relate to the Cyril Cunningham Nature Reserve.

a. limiting prohibited activities including unauthorized access from hikers, off-road vehicles and campers,
b. maintaining signage at the perimeter of the SMA,
c. engaging First Nations to be part of the SMART,
d. planning for future wildfire suppression, and
e. developing ecological restoration protocols.

Recommendation

ITF should continue to work with Mount Tuam SMART on shared initiatives to aid in the management of reserve and Mount Tuam as a whole.

6.7.2 Non-native Invasive Species Removal

The distribution of invasive species in the reserve has been kept low to this point partially due to the work of partners from the SMART mapping the distribution and controlling invasive species in the surrounding lands. If work to control the spread of these species on adjacent properties were to cease the threat of infestation on the reserve increases drastically. There are currently invasive grasses and forbs in the Garry Oak meadows and utility corridor and if during the course of this plan a funding opportunity is available for an effective management strategy to remove these non-natives it will be considered.

Recommendation
ITF should develop a program to remove and control woody invasive plants on the reserve. Annual monitoring should assess the spread of existing invasive plants and any invasions of addition invasive plant species. ITF should also continue to engage with SMART to monitor and manage priority invasive species to limit their spread into and within the reserve.

6.7.3 Wildfire Planning

The responsible agency for fire suppression on Mount Tuam is the Cobble Hill Fire Station under the Ministry of Forests, Lands and Natural Resource Operations. The initial attack for fire suppression on Mount Tuam will be by air. Mount Tuam SMART has had several meetings with the Cobble Hill Fire Station to explain the sensitivities of the mountain and the high number of Species at Risk that may be impacted by fire suppression activities. Mount Tuam SMART has included Mount Tuam in the 2013 South Island Natural Resource District Fire Management Plan (FMP) which guides fire suppression efforts. Recommendations in the FMP include avoiding the use of salt water and fire retardants, minimizing the use of heavy equipment in meadow areas to minimize soil disturbance and avoiding cutting large Garry Oak trees.

Recommendation
ITF should continue to support the work that has gone into the FMP and the initiatives to protect the ecological values in the reserve.

6.7.4 Studies/inventories

The Salt Spring Island Conservancy has done numerous plant, bird, gastropod, amphibian, reptile and invertebrate surveys throughout Mount Tuam. However, there have been few surveys in the reserve.

Recommendation
ITF should pursue further surveys for Species at Risk in order to guide management and support recovery of Species at Risk.

6.7.5 Leafless Wintergreen

To date, the only Species at Risk found in the reserve is the blue-listed leafless wintergreen (Pyrola aphylla). This species requires no special protection initiatives at this time.

Recommendation
ITF should monitor research for any new special protection initiatives or strategies to guide management of areas with leafless wintergreen during the life of this plan.

7.0 Action Items

Management Plan action items are measurable and achievable tasks that the ITF can complete to ensure that the protected area is managed in the best possible way. The

following management action items are based on the public consultation and recommendations made in this management plan and listed in priority sequence, subject to available funding resources.

7.1 Immediate Actions (1-2 years)

1. Continue to conduct annual site visits to monitor covenant compliance and identify management concerns.
2. Continue to collaborate with Mount Tuam SMART to limit trespassing, maintain signs, communicate wildfire suppression preferences, identify unauthorized users, deliver public outreach and determine restoration and management protocols.
3. Continue to map and remove invasive species as funding allows.
4. Install a sign at the southeast corner property boundary.
5. Conduct Species at Risk inventories to inform management decisions as funding allows and seek out protection initiatives that have been developed for these species.

7.2 Short term Actions (3-5 years)

1. Support ongoing research to inform management provided it does not negatively impact sensitive species.
2. Conduct monitoring for Species at Risk, invasive species and other management concerns subject to available resources.
3. Work with BC Hydro, Telus, and the Victoria Airport Authority to develop Best Management Practices for clearing utility line right of way to minimize negative impacts to Cyril Cunningham Nature Reserve and the adjacent conservation covenants.

7.3 Long term Actions (5+ years)

1. Subject to funding, develop strategies to enhance and restore the habitat of the Garry Oak meadows.

8.0 Conclusion

Cyril Cunningham Nature Reserve is part of an important protected area network, the Mount Tuam Special Management Area that is managed in collaboration with a multi-jurisdictional group collectively working on common management issues. This SMA provides important habitat for a range of native species and many Species at Risk.

The ITF will act on the management action items identified in this plan to achieve the vision, objectives and purpose of the Cyril Cunningham Nature Reserve. Future management issues may lead to further action items that will be identified in work plans and in future revisions of this plan.

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10.0 Appendices

Appendix A Coordinates and Locations of Photopoints in the Cyril Cunningham Nature Reserve

(All photopoints are centered on survey iron pins)

Feature	Vegetation Type	UTM Easting	UTM Northing	Photo Aspect	Date	Comments
Stn. A	5	10U 464861	5396088	245º	23- FEB-14	Pin on southeast corner of CCNR. Orange flag from ground to cedar branch. Photo matched to 2013 monitoring photo.
Stn. B	5	10U 464862	5396137	170º	03-MAR-14	Photo taken from northeast corner of CCNR. Corner stake not found but small alder tree flagged with pink and orange at the correct location
Stn. C	4	10U 464810	5396137	240º	03-MAR-14	Photopoint at iron pin at north east boundary of power line utility corridor. Corner stake at base of large maple.
Stn. D	4 and 2	10U 464771	5396138	90 º and 180º	03-MAR-14	Iron pin at north west boundary of power line utility corridor.
Stn. E	1	10U 464052	5396145			Corner pin not found- no photo taken
Stn. F	2	10U 464051	5396096	360º	03-MAR-14	Corner pin at southwest corner of CCNR- wooden stake in photo.
Stn. G	2	10U 464071	5396096	360º	03-MAR-14	Photo taken at northwest corner of Lot 6 and CCNR boundary. Small pink flag found on small Douglas-fir at correct location. Corner stake not found.
Stn. H	1	10U 464185	5396095	320º	23- FEB-14	Photopoint is boundary between Vegetation type 1 and 2. On pin at north corner of Lot 5 and 6 and CCNR boundary.
Stn. I	1	10U 464231	5396094	360º	03-MAR-14	On pin at north corner of Lot 4 and 5 and CCNR boundary- wooden corner stake in photo.
Stn. J	1	10U 464354	5396093	360º	03-MAR-14	On pin at north corner of Lot 3 and 4 and CCNR boundary- wooden corner stake in photo.

Stn. K	2	10U 464486	5396092	360º	03-MAR-14	On pin at north corner of Lot 2 and 3 and CCNR boundary- wooden corner stake in photo.
Stn. L	2	10U 464633	5396090	300º	03-MAR-14	On pin at north corner of Lot 1 and 2 and CCNR boundary.

Appendix B. Coordinates and Locations of Other Features in Cyril Cunningham Nature Reserve

Feature	Vegetation Type	UTM Easting	UTM Northing	Elevation	Date	Comments
Cliff	2	10U 464673	5396126	115 m	07-FEB-14	Cliff is continuous between points between vegetation Types #2 and #3
Cliff	2	10U 464480	5396141	131 m	07-FEB-14	
Large Douglas-fir	2	10U 464766	5396096	90 m	05-FEB-14	Three large fire-scarred trees
Large Douglas-fir	1	10U 464068	5396142	155 m	07-FEB-14	Single fire-scarred tree
Large Arbutus	2	10U 464690	5396117	111 m	07-FEB-14	Many large trees
Sideband Snail	2	10U 464645	5396098	104 m	07-FEB-14	
Holly	1	10U 464430	5396138	135 m	07-FEB-14	Invasive plant
Holly	1	10U 464382	5396108	126 m	07-FEB-14	Invasive plant
Holly	1	10U 464368	5396107	142 m	07-FEB-14	Invasive plant
Gully	1	10U 464136	5396136	158 m	07-FEB-14	Series of northeast to southwest gullies
Gully	1	10U 464094	5396126	139 m	07-FEB-14	
Gully	2	10U 464077	5396101	128 m	07-FEB-14	
Power pole	4	10U 464810	5396120	87 m	07-FEB-14	Power line continues from road at Cunningham Covenant to summit of Mount Tuam

Appendix C. Photographs of Photopoints in Cyril Cunningham Nature Reserve

Photo Station A. 245º.

Photo Station B. 170º. Note orange flag around trunk of small tree in background.

Photo Station C. 240º. Note power pole at left in photo and power line across the top.

Photo Station D. 90º. Note power line cable across center of photo.

Photo Station D. 180º.

Photo Station F. 360º. Note corner stake at bottom of photo.

Photo Station G. 360º. Note pink flag at top of photo taken to indicate corner pin.

Photo Station H. 320º.

Photo Station I. 360º. Note wooden stake in foreground.

Photo Station J. 360º. Note wooden stake in foreground.

Photo Station K. 360º. Note wooden stake in foreground.

Photo Station L. 300º.

Appendix D. Photographs of Significant Features in Cyril Cunningham Nature Reserve

Most easterly portion of cliff that demarcates Vegetation Type 3 and Vegetation Type 2.

Very large Arbutus trees in Vegetation Type 2.

Large veteran Douglas-fir in Northwest corner of Cyril Cunningham Nature Reserve in Vegetation Type 1. Note fire scars on bark.

Large veteran Douglas-fir tree in middle of Cyril Cunningham Nature Reserve in Vegetation Type 2. Note fire scars on bark.

Power lines utility corridor (taken from Cunningham Covenant) showing Vegetation Type 4.

Hiking trail in Cyril Cunningham Nature Reserve.

Page wire and t-post fence.

Pacific Sideband Snail.

Appendix E. Photographs of Vegetation Types in Cyril Cunningham Nature Reserve

Vegetation Type 1.

Vegetation Type 2.

Vegetation Type 3.

Vegetation Type 4.

Vegetation Type 5.

Appendix F. Public Consultation Letter

May 16, 2016

Dear «FullName»,

The Islands Trust Fund is updating the management plan for the Cyril Cunningham Nature Reserve on Salt Spring Island (PID 018-650-422, Lot B, Section 32, South Salt Spring Island, Cowichan District, Plan VIP 58173) and would like your input.

The original management plan was written in 1995 with a revision in 2005 and it can be found on our website:
http://www.islandstrustfund.bc.ca/media/10364/itfmgmtplancunningham.pdf

Cyril Cunningham Nature Reserve is a 3.84 hectare (9.49 acre) protected area on the south end of Salt Spring Island overlooking Satellite Channel and the Saanich Peninsula. It is a long east-west strip that runs a steep course across the lower slopes of Mount Tuam.

The Reserve was donated to the Trust Fund Board at the time of the Cape Keppel strata subdivision in 1994. The Islands Trust Fund works with the covenant co-holders, Habitat Acquisition Trust (HAT) and the Salt Spring Island Conservancy (SSIC) to monitor and manage the property in order to protect the unique ecological values. This property includes about 0.32 ha of open rock outcrop and 3.52 ha of second-growth forest.

The Reserve is part of a 400 hectare continuous protected area known as the Mount Tuam Special Management Area (SMA). The SMA is being cooperatively managed by a multi-jurisdictional group known as the Mount Tuam Special Management Area Resource Team

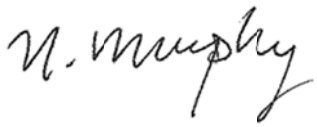
(SMART). As a whole, this area faces the same external threats including off-road vehicle traffic, overgrazing, and conifer encroachment associated with fire suppression.

The current management for the Nature Reserve focuses on protecting the natural values of the property. Development of any kind, including disturbance to native vegetation, soils, and water flow, is prohibited. As well, public use and access are not encouraged. The updated plan will support ongoing species inventories, removing non-native invasive species and protecting all of the native plants and animals on the reserve.

In order to develop a good plan for the nature reserve, your input is requested. We would like to hear from the neighbours of the Cyril Cunningham Nature Reserve with your ideas and concerns regarding the long-term management of this special place. Please find enclosed a questionnaire that can be completed and either mailed or scanned to me by email.

Many thanks for taking the time to consider the management of this nature reserve. For more information, please contact me at the number or email below.

Yours sincerely,



Nuala Murphy
Property Management Specialist, Islands Trust Fund
Phone: 250-405-5193
Email: nmurphy@islandstrust.bc.ca

Appendix G. Public Consultation Questionnaire

Cyril Cunningham Nature Reserve Questionnaire

Cyril Cunningham Nature Reserve is 3.84 hectares in a long East-West strip on the south end of Salt Spring Island. It includes about 0.32 ha of open rock outcrop and 3.52 ha of second-growth forest within the Coastal Douglas-fir biogeoclimatic zone.

The Islands Trust Fund received the land as a donation in 1994 and the first management plan for the Cyril Cunningham Nature Reserve was written in 1995. The Islands Trust Fund's primary goal is to protect and nurture the sensitive ecosystems on this land. To do that, we revise our management plans approximately every 10 years to guide the management of the property and its features. We are asking you to help us develop this plan. Please share your thoughts on the protection and long-term management of the property.

1. Where do you live?

- ◯ South Salt Spring
- ◯ North Salt Spring
- ◯ Mid Salt Spring
- ◯ Off-island

2. How often do you visit Cyril Cunningham Nature Reserve?
- ◯ Once a week or more
- ◯ Once a month
- ◯ Several times per year
- ◯ Once a year or less
- ◯ Never

3. What activities do you and/or your family enjoy when visiting Cyril Cunningham Nature Reserve?
- ◯ Hiking/walking
- ◯ Dog walking
- ◯ Other (please list)

4. Please list any wildlife and unique plant species you have seen at or near Cyril Cunningham Nature Reserve?

5. What do you believe to be the most important values of nature reserves (choose three)
- ◯ Protection of habitat for at-risk species
- ◯ Ecosystem services (e.g. clean water and air, erosion control, groundwater recharge, etc)
- ◯ Recreational opportunities
- ◯ Education and research opportunities
- ◯ Tourism
- ◯ Aesthetic appeal
- ◯ Conservation for the sake of the intrinsic value of nature
- ◯ Other (please specify):

6. What activities do you believe are incompatible with the protection of natural features, and should not be allowed within the Cyril Cunningham Nature Reserve?

7. What do you feel could be the greatest threat to the health of this nature reserve, and should be the highest management priority for the Islands Trust Fund?

8. Please provide any other relevant information that will help us make the best management decisions for Cyril Cunningham Nature Reserve.

9. Please share with us any history you know about this property (or the south end of Salt Spring) or any knowledge you have about unique cultural or other special features on the property.

10. If you would like to receive updates from the Islands Trust Fund on this, and other conservation projects on the islands, please provide your name and email address:

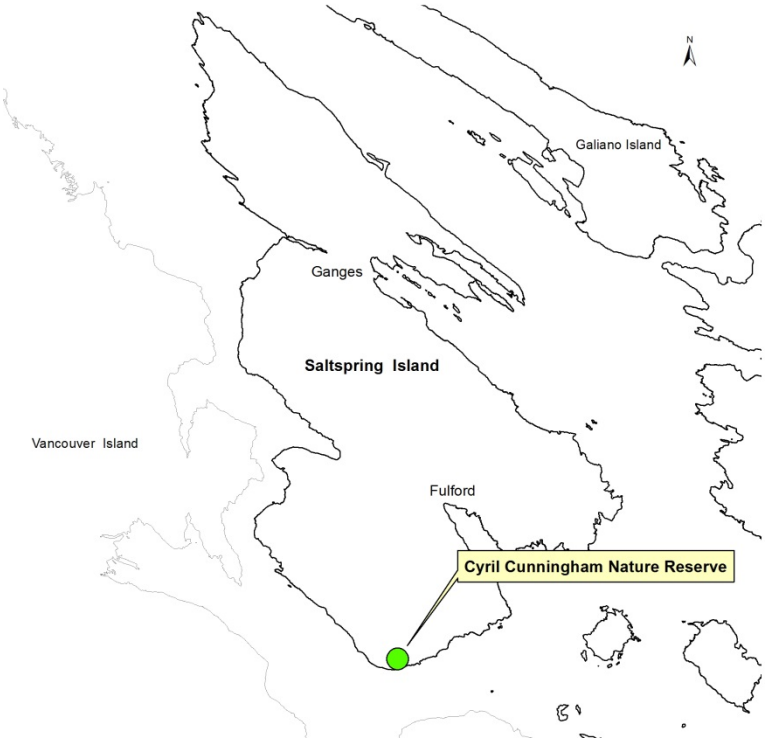
Thank you for your time spent helping us plan the future of the Cyril Cunningham Nature Reserve.

Appendix H. Public Consultation First Nations Letter

May 13, 2016

Dear «Greeting»,

The Islands Trust Fund is updating the management plan for the Cyril Cunningham Nature Reserve on Salt Spring Island (PID 018-650-422, Lot B, Section 32, South Salt Spring Island, Cowichan District, Plan VIP 58173) and would like your input.



The original management plan was written in 1995 with a revision in 2005. Cyril Cunningham Nature Reserve is a 3.84 hectare (9.49 acre) area on the south end of Salt Spring Island overlooking Satellite Channel and the Saanich Peninsula. It is a long East-West strip that runs a steep course across the lower slopes of Mount Tuam.
The Reserve was donated to the Trust Fund Board as part of a subdivision application in 1994. The Islands Trust Fund works with the covenant co-holders, Habitat Acquisition Trust (HAT) and the Salt Spring Island Conservancy (SSIC) to manage the property in order to protect the unique ecological values. This property includes about 0.32 ha of open rock outcrop and 3.52 ha of second-growth forest.

The Reserve is part of a 400 hectare continuous protected area known as the Mount Tuam Special Management Area (SMA). The SMA is being cooperatively managed by a multi-

jurisdictional group known as the Mount Tuam Special Management Area Resource Team (SMART). As a whole, this area faces the same external threats including off-road vehicle traffic, overgrazing, and conifer encroachment associated with fire suppression.

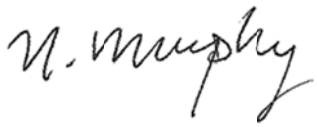
The current management for the Nature Reserve focuses on protecting the natural values of the property. Development of any kind, including disturbance to native vegetation, soils, and water flow, is prohibited. As well, public use and access are not encouraged. The updated plan will support ongoing species inventories, removing non-native invasive species and protecting all of the native plants and animals on the reserve.

As a First Nation with interests on Salt Spring Island, the Islands Trust Fund would like to involve you in the planning process for the management of this special property. We would be very interested in learning from you how our management plan and subsequent activities can acknowledge and respect the cultural significance and traditional use of this area.

We would welcome your input on the continued management of this protected area. If you would like to have more information or to meet to discuss, please contact Nuala Murphy, Islands Trust Fund, Property Management Specialist at the number below.

Thank you for your guidance.

Yours sincerely,



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