

**Management Plan for
Elder Cedar (S'ul-hween X'pey)
Nature Reserve
Gabriola Island, British Columbia**



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Executive Summary

In 2006, the Islands Trust Fund acquired the 65.36 hectare (approximately 161.51 acres) property now known as the Elder Cedar (S'ul-hween X'pey) Nature Reserve under the Province of British Columbia's Free Crown Grant program.

Islands Trust Fund policy requires that a management plan be developed for all properties that it owns or manages. In October 2006, Taara Environmental was retained to develop a management plan and to solicit ideas for naming the Nature Reserve.

The Islands Trust Fund objectives for the management of the Elder Cedar (S'ul-hween X'pey) Nature Reserve are as follows:

- To preserve the natural features and functioning of the site;
- To allow for continued low impact recreational use and enjoyment of the site;
- To ensure that permitted uses do not harm the ecological attributes of the site;
- To protect, and enhance where necessary, the natural succession of the plant and animal communities at the site; and
- To provide for educational and research opportunities where deemed appropriate.

The nature reserve is characterized by maturing Douglas-fir forest and contains some of the last remaining old growth forest on Gabriola Island. Rocky outcrops, several streams and additional smaller wetland complexes are scattered throughout the reserve, offering high biodiversity values. Two blue-listed species and four rare plant communities were identified within the reserve. Additional rare species may be identified as the forest ecosystem matures.

The property contains several trails that the local people use for walking and nature appreciation. Several of these trails connect to trail systems on adjacent federal land holdings to the west and north of the reserve. Recreational use of the reserve by mountain bikes, all-terrain vehicles, horses and increased foot traffic has caused damage to the sensitive root structure and thin soils along trails and sensitive rocky outcrop areas in the north of the reserve. Signage, and in some instances, the use of barriers to prohibit these activities in parts or all of the reserve will be installed.

Uses of the nature reserve permitted in this management plan include:

- Walking, as well as access by wheelchairs or other devices used by those with motor impairments;
- Dog-walking, provided dogs remain leashed and feces are removed;
- Wildlife Viewing and Photography; and
- Traditional Gathering of medicinal and food plants.

There are 14 recommendations for active management of the property such as installing signs, removing reference to the reserve from tourist information sources, removing mountain bike trail structures and removing invasive plants.

Acknowledgements

The Trust Fund Board and staff would like to acknowledge the support and cooperation of the Snuneymuxw First Nation in whose traditional territory the Nature Reserve falls. We look forward to coordinating management of the nature reserve with the adjacent treaty settlement land and discussing how to incorporate traditional uses such as the gathering of food and medicines into the long-term management of the property.

We were honoured to receive from linguist Dr. Ellen White the translation of the property name “Elder Cedar” into the Hul’q’umi’num language.

A special thank you goes out to the Gabriola Island Local Trust Committee and the Gabriola Land Conservancy for their years of dedication and foresight during the campaign to preserve this property for the future enjoyment and appreciation of Gabriola Island residents.

Thank you to all residents of Gabriola Island and other stakeholder groups who provided comments in reference to the naming and management of the Elder Cedar (S’ul-hween X’pey) Nature Reserve and review of this plan as it progressed.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	I
ACKNOWLEDGEMENTS	II
TABLE OF CONTENTS	II
LIST OF FIGURES.....	IV
LIST OF TABLES.....	IV
1.0 INTRODUCTION.....	1
1.1 ISLANDS TRUST FUND MANAGEMENT PLANS	1
1.2 ELDER CEDAR (S’UL-HWEEN X’PEY) NATURE RESERVE PURPOSE	2
1.3 ELDER CEDAR (S’UL-HWEEN X’PEY) NATURE RESERVE OBJECTIVES	2
2.0 SITE INFORMATION.....	2
2.1 LOCATION	2
2.2 SITE DESCRIPTION.....	6
2.3 LEGAL DESCRIPTION	6
2.4 LOCAL AND REGIONAL CONTEXT	6
2.5 SITE HISTORY	7
2.6 CURRENT USE	8
2.7 ADJACENT LAND USE	8
2.8 CONNECTIVITY.....	8
3.0 ENVIRONMENTAL INVENTORY	9
3.1 GEOLOGY AND PHYSIOLOGY.....	9
3.2 SOILS	9
3.3 ECOSYSTEMS.....	10
3.3.1 <i>Vegetation Type 1</i>	12
3.3.2 <i>Vegetation Type 2</i>	13
3.3.3 <i>Vegetation Type 3</i>	13
3.3.4 <i>Vegetation Type 4</i>	14
3.3.5 <i>Vegetation Type 5</i>	15
3.3.6 <i>Vegetation Type 6</i>	16
3.3.7 <i>Vegetation Type 7</i>	17
3.4 INVASIVE SPECIES	17
3.5 RARE PLANTS, ANIMALS AND ECOLOGICAL COMMUNITIES.....	19
3.6 WILDLIFE AND WILDLIFE HABITAT.....	20
3.7 BIRD SPECIES	20
4.0 PUBLIC INFORMATION SESSION AND INPUT	21
5.0 MANAGEMENT PLAN.....	22
5.1 ISSUES AND DISCUSSION	22
5.1.1 <i>Trail Use and Location</i>	22
5.1.2 <i>Trail Maintenance and Safety</i>	26
5.1.3 <i>Permitted Uses</i>	27
5.1.4 <i>Exotic and Invasive Species</i>	28
5.1.5 <i>Illegal Dumping</i>	31
5.1.6 <i>Protection of Sensitive Eco-systems and Species at Risk</i>	31
5.1.7 <i>Fire Management</i>	32
5.1.8 <i>Education and Research</i>	32
5.1.9 <i>Capacity</i>	32
5.2 MANAGEMENT STRATEGIES.....	33

6.0	CONCLUSION.....	35
7.0	REFERENCES.....	35
8.0	APPENDICES	37
	APPENDIX A. ENVIRONMENTAL INVENTORY DATA.....	37
	APPENDIX B. PUBLIC INPUT	43
	APPENDIX C. PHOTOS.....	44
	APPENDIX D. PROPOSED MONITORING ROUTE.....	47

List of Figures

FIGURE 1. REGIONAL CONTEXT MAP	4
FIGURE 2. AIRPHOTO	5
FIGURE 3. VEGETATION TYPES.....	11
FIGURE 4. PHYSICAL FEATURES	23
FIGURE 5. INVASIVE SPECIES.....	30
FIGURE 6. PHOTOGRAPH LOCATIONS.....	46
FIGURE 7. PROPOSED MONITORING ROUTE	49

List of Tables

TABLE 1. SUMMARY OF VEGETATION TYPES	10
TABLE 2. INVASIVE FLORAL SPECIES	17
TABLE 3. RARE ANIMALS.....	19
TABLE 4. RARE ECOLOGICAL COMMUNITIES.....	19
TABLE 5. LIST OF WILDLIFE SPECIES.....	20
TABLE 6. LIST OF BIRD SPECIES	20
TABLE 7. SPECIES LIST FOR VEGETATION TYPE 1	37
TABLE 8. SPECIES LIST FOR VEGETATION TYPE 2	38
TABLE 9. SPECIES LIST FOR VEGETATION TYPE 3	39
TABLE 10. SPECIES LIST FOR VEGETATION TYPE 4	39
TABLE 11. SPECIES LIST FOR VEGETATION TYPE 5	40
TABLE 12. SPECIES LIST FOR VEGETATION TYPE 6	41
TABLE 13. SPECIES LIST FOR VEGETATION TYPE 6	42
TABLE 14. SPECIES LIST FOR VEGETATION TYPE 7	42
TABLE 15. LIST OF PHOTOS	44

1.0 Introduction

The islands between Vancouver Island and the mainland of British Columbia are recognized as a special place with a unique natural environment and rural character. In recognition of the unique attributes of this area, the Provincial Government established the Islands Trust in 1974. The Islands Trust is a local government created with a special legislated provincial mandate *‘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 Act).

In 1990, through the enactment of a section of the Islands Trust Act, the Islands Trust Fund (ITF) was established to carry out the *‘preserve and protect’* mandate of the Islands Trust. The vision of the Islands Trust Fund is *‘to create a legacy of special places, protecting both natural and cultural features in perpetuity in order to sustain the unique character and environment of the Islands Trust Area.’* The goal of the Islands Trust Fund Board is to establish protected areas on all major and many of the associated islands within the Islands Trust Area.

The Elder Cedar (S’ul-hween X’pey) Nature Reserve was granted to the Islands Trust Fund by the Provincial government on May 10th, 2006 under a free Crown land grant sponsored by the Minister of Community Services. The 65.36 hectare (approximately 161.51 acres) property has been the subject of local conservation efforts for over twenty years. The property contains some of the last remaining mature forest stands on Gabriola Island with abundant veteran Douglas fir and several freshwater wetlands and riparian areas. The property is also an important public recreational destination for walking and nature appreciation on an island with few public spaces (Islands Trust Fund, 2006).

Taara Environmental was retained by the Islands Trust Fund to prepare a management plan for the Elder Cedar (S’ul-hween X’pey) Nature Reserve in October 2006.

1.1 Islands Trust Fund Management Plans

Islands Trust Fund management plans are used to provide long term direction and guidance for the protection of values and features of significance on Islands Trust Fund properties. The Islands Trust Fund requires that management plans are developed for all properties that it acquires.

Generally, management plans will address the following:

- The purpose and objectives for the site;
- Background information including site history and local and regional context;
- Environmental inventory;

- Management issues such as the extent and nature of protection required, appropriate uses and level of use, research guidelines, risk management, special needs at the site; and
- Strategies and actions to achieve the purpose and objectives of the site and to address management issues and needs (Islands Trust Fund, 2003).

1.2 Elder Cedar (S’ul-hween X’pey) Nature Reserve Purpose

The purpose of establishing the Elder Cedar (S’ul-hween X’pey) Nature Reserve is as follows:

- To preserve and protect the natural values of the site;
- To allow natural succession of the reserve’s ecosystems to occur unimpeded; and
- To protect the site in accordance with the objectives of the Islands Trust and Islands Trust Fund.

1.3 Elder Cedar (S’ul-hween X’pey) Nature Reserve Objectives

The Islands Trust Fund objectives for the management of the Elder Cedar (S’ul-hween X’pey) Nature Reserve are as follows:

- To preserve the natural features and functioning of the site;
- To allow for continued low impact recreational use and enjoyment of the site;
- To ensure that permitted uses do not negatively impact or cause harm to the ecological attributes of the site;
- To protect, and enhance where necessary, the natural successional processes of the plant and animal communities at the site; and
- To provide for educational and research opportunities where deemed appropriate.

2.0 Site Information

The following section provides a brief overview of the Elder Cedar (S’ul-hween X’pey) Nature Reserve including its location and context within a regional and local protected areas network and outlines its unique attributes and features.

2.1 Location

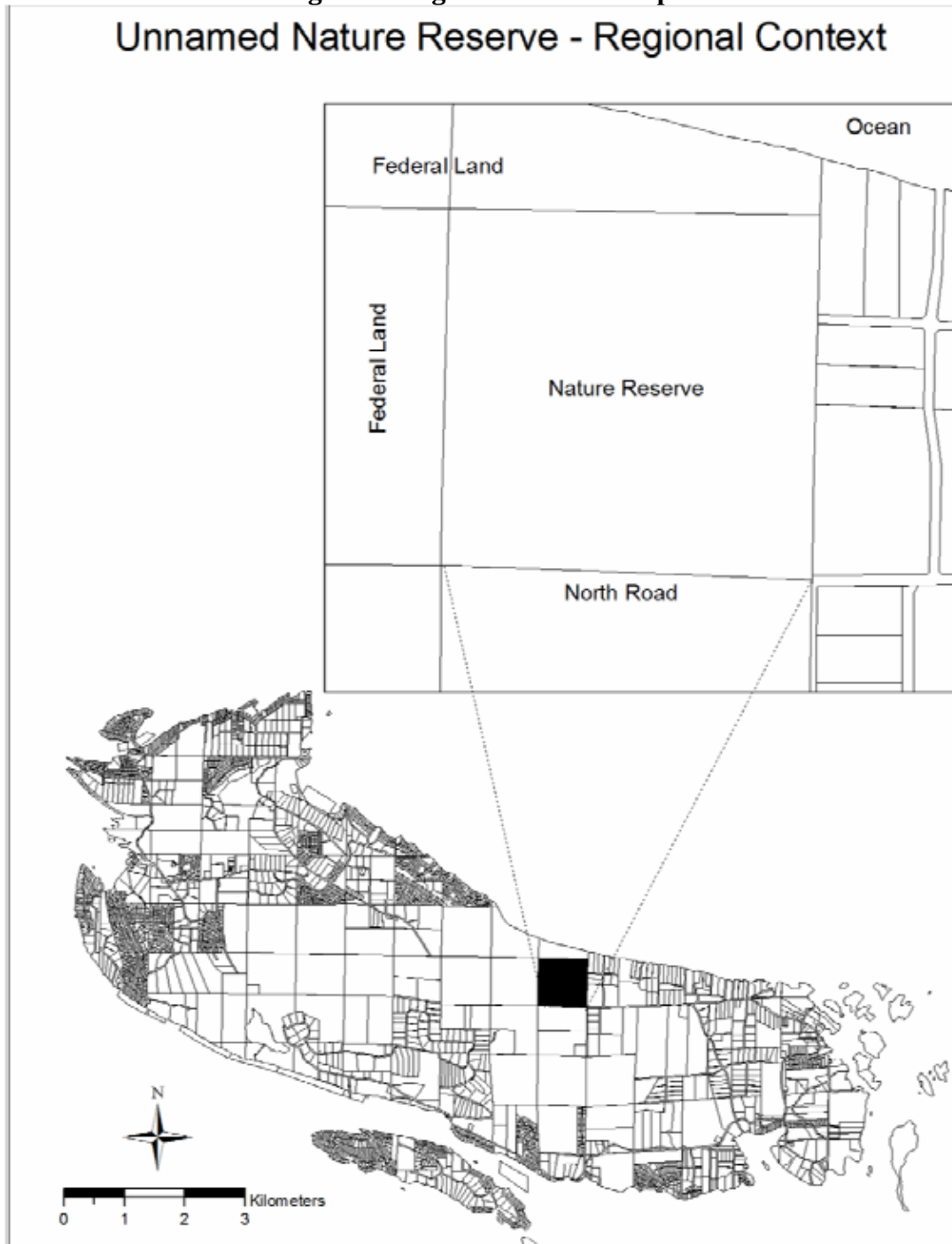
The Elder Cedar (S’ul-hween X’pey) Nature Reserve is located in central Gabriola Island, just south of the northern shoreline (Figure 1). The reserve can be accessed from North Road at its southern boundary and from Windecker Road on the eastern boundary.

Trails also enter the property from adjacent federal lands to the west and north of the reserve and from private properties to the east of the reserve. Vehicle access can also be

obtained via an old forestry road running the length of the property at its northern boundary.

Gabriola Island is located a short ferry trip from the city of Nanaimo on the eastern shores of Vancouver Island. The reserve is located a short drive east of the ferry terminal on North Road, along what local residents refer to as the 'North Canopy' or "The Tunnel", a stretch of scenic tree-lined road favored by drivers and cyclists.

Figure 1. Regional Context Map¹



¹ Discrepancies were found between the Islands Trust cadastral map and the actual locations of the reserve property lines. In some areas the boundaries differed by as much as 10 metres. Therefore, the following maps (with the exception of Figure 1) were produced using the property lines mapped during the inventory and do not show the adjacent cadastre.

Figure 2. Airphoto



2.2 Site Description

The Elder Cedar (S'ul-hween X'pey) Nature Reserve is a 65.36 hectare (approximately 161.51 acres) property which contains some of the last remaining mature forest on Gabriola Island. The property is characterized by mixed young to mature conifer forest with several interconnecting riparian and wetland complexes which contribute substantially to the biodiversity values of the reserve.

The property was logged in the early 20th century and several areas of the property exhibit signs of this early logging, with abundant old tree stumps and maturing second growth forest. There are also signs of previous fire scarring on some of the veteran trees within the reserve (Triton Environmental, 1999). The property contains several scattered veteran Douglas firs and hemlocks that survived early logging practices (Gabriola Conservancy, 1992). The reserve is also characterized by several intermittent streams and wetland complexes, of which Stoney Creek is the largest; running relatively parallel to the property's southern boundary. An intermittent creek leaving the property in the north end, cascades into the ocean just to the north of the property boundary.

The property is accessible from two locations off of North Road and additional trails enter the property from the end of Windecker Road along the eastern boundary. A small footpath leads to the undeveloped federal lands to the west and additional vehicle access can be obtained from an old forestry road that runs along the reserve's northern border.

2.3 Legal Description

The Elder Cedar (S'ul-hween X'pey) Nature Reserve includes those lands with Parcel Identification Number 026-664-453 Block A Section 16 Gabriola Island Nanaimo District Plan 57324. The Gabriola Island Land Use Plan currently designates the property as 'Park 2' (Passive Recreation Community Park) and the parcel is designated as 'Park' in the Official Community Plan for the area (Gabriola Local Trust Committee, 1999).

2.4 Local and Regional Context

Gabriola Island is located in the Strait of Georgia between the east coast of Vancouver Island and the British Columbia Mainland. It is located a short ferry trip from the City of Nanaimo on Vancouver Island. Gabriola Island has approximately 4,000 year round residents, although that population may more than double during the summer months due to its accessibility from larger urban centers.

The Elder Cedar (S'ul-hween X'pey) Nature Reserve is one of several protected areas on the island, with three provincial parks and several community and regional parks adding to the protected areas network on the island. In the eastern end of the island is Drumbeg Provincial Park and Petroglyph Heritage Park. A small community park on South Road is also found on the eastern half of the island. Larger parks in the western end of the island include the 707 Acres Community Park and Cox Community Park, which connects to Descano Bay Community Park. Several smaller waterfront and community parks dot the

northern shoreline of the island, including Sandwell Provincial Park and Gabriola Sands Provincial Park (Gabriola Lands and Trails Trust, 2006).

In addition to provincial and community park lands, the Islands Trust Fund owns or manages an additional three Nature Reserves on the island; including Bachmann, Coats Millstone and Reid Chapman (Islands Trust Fund, 2006). These Nature Reserves are significantly smaller than the Elder Cedar (S'ul-hween X'pey) Nature Reserve. Several federal land holdings in the centre of the island have also contributed historically to the local trail network and recreational opportunities. These lands are currently being held as Treaty settlement lands with the Snuneymuxw First Nation.

2.5 Site History

Gabriola Island has a long history of First Nation occupation and use, and the forest lands adjacent to the reserve are currently being held as Treaty settlement lands with the Snuneymuxw First Nation. The island was used for summer camps and fishing grounds and due to its proximity to the northern shoreline of the island; it is possible that lands within the reserve may have been used for its forest and freshwater resources (Snuneymuxw First Nation, 2007).

The property was logged in the early twentieth century and remnant stumps and partially overgrown logging roads can be found scattered throughout the reserve. Signs of fire scarring are also evident amongst the standing veteran trees within the reserve. The majority of the forest is maturing second growth, although there are areas with younger forest which may be a result of more recent logging activity or indicative of poor growing conditions.

In the late 1980's the property was placed into provincial forest lands, however, although Weldwood of Canada acquired the rights to harvest surrounding properties, the reserve was not logged. In 1992, the Gabriola Conservancy requested that the Islands Trust Fund apply to have the property transferred for conservation purposes due to its high ecological importance.

In 1993, BC Parks identified the reserve as an 'important contribution needed in the ecological reserve system'; however the property was never included in the system despite a provincial biologist stating that the property has 'very high biodiversity values' in 1999. During an ecological study of the property and additional woodlots in the area, Triton Environmental Consultants identified several red-listed and blue-listed plant communities and wildlife species within the Elder Cedar (S'ul-hween X'pey) Nature Reserve's boundaries.

In 2002, the Local Trust Committee for Gabriola Island passed a resolution to support the acquisition of the property by the Islands Trust Fund. After the Province's Free Crown Land Grant program was revised in 2004, the Islands Trust Fund Board was successful in its application to have the property transferred for conservation purposes (Islands Trust Fund, 2006).

2.6 Current Use

The Elder Cedar (S'ul-hween X'pey) Nature Reserve has been well used locally for recreational pursuits and as a public space. The trail system within the reserve has historically been maintained by horseback riders and mountain bikers, and several mountain bike improvements, such as jumps and stream crossings were observed during field visits. Since the Islands Trust Fund has acquired the property, the use of the reserve by trail riders and cyclists has diminished significantly as noted by local users of the reserve.

The reserve has also attracted activities such as walking and nature appreciation. It is a local destination for bird watchers, photographers and botanists. For many local residents, the reserve offers a peaceful retreat for meditation and spiritual renewal.

Additional use and access from adjacent federal lands by all-terrain vehicles and four-wheel drive was observed during field visits in November 2006. This has resulted in the compaction and disturbance of soil in localized areas within the reserve. Local residents have also reported the infrequent use of the reserve by salal and wood harvesters.

2.7 Adjacent Land Use

The Elder Cedar (S'ul-hween X'pey) Nature Reserve is located in close proximity to the northern shoreline in the center of Gabriola Island. It is surrounded by undeveloped federal lands along its northern and western boundaries, which are currently being held as potential Treaty settlement lands with the Snuneymuxw First Nation. These properties are locally referred to as the 'Kensington lands'. These properties are currently used by residents and visitors for the same recreational pursuits as those currently pursued in the Elder Cedar (S'ul-hween X'pey) Nature Reserve and the main trail in the northern portion of the property acts as an important connector to these federal lands. Vehicle access in the northern portion of the property is from a road system that originates off of these land holdings.

Across North Road from the reserve's southern boundary is a previously clear cut eighty acre forestry lot that has recently passed into private ownership for residential purposes. Four additional residential properties are found along the reserve's eastern border (Islands Trust Fund, 2006). These properties are small residential acreages, some of which house horses and other domestic animals.

2.8 Connectivity

The Elder Cedar (S'ul-hween X'pey) Nature Reserve is connected to federal lands along its northern and western boundary. These lands connect the reserve to the northern shoreline of Gabriola Island and additional trail systems to the north and the 707 Acres Community Park to the west. The federal lands have been logged in the past, and forest cover is a young to maturing Douglas-fir plantation with low biodiversity values. As this forest matures, its ecological value will increase substantially. The northern portion of the

federal lands contains a seasonal scenic waterfall with its origins in the Elder Cedar (S'ul-hween X'pey) Nature Reserve. The main trail in the north end of the Elder Cedar (S'ul-hween X'pey) Nature Reserve is an important connecting route to the federal lands for local recreational users.

The property to the south of the reserve is a former forestry lot that is now privately owned and has been developed for residential purposes. This property backs onto provincial forest lands, all of which have been logged in recent history. As these forests mature, they will add more significantly to the biodiversity values on the landscape and contribute more substantially to the natural value of lands surrounding the Elder Cedar (S'ul-hween X'pey) Nature Reserve.

3.0 Environmental Inventory

The following section provides a detailed description of the Elder Cedar (S'ul-hween X'pey) Nature Reserve's physical and natural attributes and outlines the reserve's unique features. Information contained in the following section was obtained during fieldwork conducted in early November 2006 and from previous studies conducted by Triton Environmental Consultants. In addition, information on the status of flora, fauna and ecological communities was obtained from the British Columbia Conservation Center database.

3.1 *Geology and Physiology*

The general geology of Gabriola Island is comprised of several alternating layers of conglomerate, sandstone and shale of the uppermost formations of the Nanaimo Group. The sediments that form the Nanaimo Group were eroded and deposited from the rising Coastal Mountains during the Upper Cretaceous. The five uppermost formations that characterize Gabriola Island include the Gabriola, Spray, Geoffrey, Northcumberland and De Courcy formations.

Based on geological mapping of the area, we find four of the five formations that may be present in the reserve. To the north lies the Northumberland formation comprised of mudstone and siltstone. Heading south from the northern shoreline is the Geoffrey formation, comprised of sandstone and conglomerate and the Spray formation, comprised of mudstone and siltstone. The Gabriola formation is the most southerly of the four formations found within the reserve and is comprised primarily of sandstones (Geoscape Nanaimo, 2006).

3.2 *Soils*

Soils within the Elder Cedar (S'ul-hween X'pey) Nature Reserve influence vegetation type and the persistence of ecological communities. In the northern portion of the reserve, the soils are shallow and dry with several exposed areas of bedrock. This is the only portion of the reserve where arbutus is found (Triton, 1999).

The lower slopes within the reserve are characterized by medium colored sandy loam to loamy sands with coarse fragments in the well-drained sites and deep gleyed horizons in wetter depressions. Lower slopes have rich to very rich nutrient regimes. These areas are characterized by Douglas fir and salal communities, as well as western red cedar and foamflower.

Ecological communities containing slough sedge are characterized by light colored sands with low coarse fragment content and a medium to rich nutrient regime. These areas also have a fluctuating water table and commonly experience localized flooding (Triton, 1999).

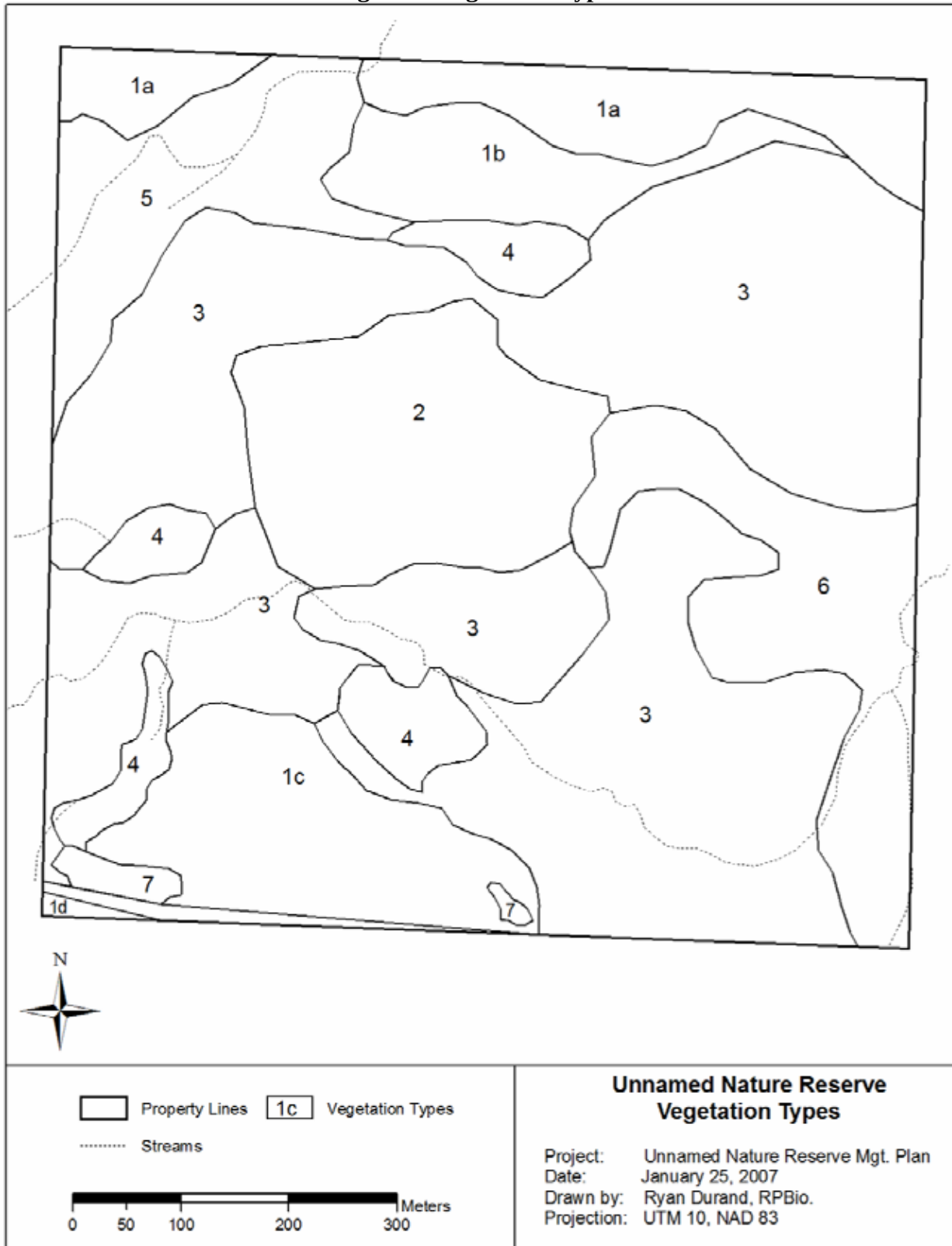
3.3 Ecosystems

The following section contains descriptions of the seven basic vegetation types identified on the reserve (Table 1). Figure 3 contains maps of the vegetation types and Appendix B contains detailed information as to the inventory methodology as well as lists of floral species that were identified.

Table 1. Summary of Vegetation Types

Veg. Type	Site Series	Description
1	CDFmm01/06	Mostly young Douglas-fir/salal forests with some mature stands. Open rocky areas to the north with infrequent young arbutus. Southern portion transitional into wetter and richer CDFmm06.
2	CDFmm05	Young to maturing Douglas-fir with suppressed western red cedar layer. Sporadic mature to old Douglas-fir veterans.
3	CDFmm06	Mostly mature forests dominated by Douglas-fir and lesser amounts western red cedar. Younger stands to the west of the reserve.
4	CDFmm14	Western red cedar, red alder, and slough sedge wetlands.
5	CDFmm06/14	Mixed forests, young to mature forests with numerous streams, seepages and slough sedge wetlands. Sporadic mature to old Douglas-fir and western red cedar veterans.
6	CDFmm06/11/14	Wet mixed forests with frequent seepages and wetlands. Varies from young to mature Douglas-fir, western red cedar and grand fir to pockets of young red alder.
7	NA	Disturbed openings actively used by vehicles along North Road.

Figure 3. Vegetation Types



3.3.1 Vegetation Type 1

Vegetation Type 1 was mapped in three areas of the reserve (Figure 3). It primarily occurred along the dry northeastern and northwestern corners. It also occupied an area along North Road where portions of the vegetation type were transitional to the wetter and richer stands of Vegetation Type 3.

This vegetation type had a northern aspect with slopes ranging from 0 to 10%. Rocky outcrops were common in the northern portion, and the area generally contained moderately coarse textured, thin soils. Coarse woody debris was common and generally well decomposed (Triton, 1999). The southern portion lacked the rocky outcrops and likely contained wetter and slightly better developed soils.

The northern portion (Vegetation Type 1a) was primarily composed of multi-storied pole sapling (under-going self thinning) to young Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*) with sporadic young arbutus (*Arbutus menziesii*). A sub-canopy of western red cedar (*Thuja plicata*), western hemlock (*Tsuga heterophylla*), Douglas-fir and grand fir (*Abies grandis*) occurred throughout much of the area. Forest stands generally changed from young to mature with sporadic veteran Douglas-fir towards the interior of the reserve (Vegetation Type 1b). Crown closure was estimated to be 50%.

Most of the southern portion (Vegetation Type 1c) contained more two-storied mature stands composed primarily of Douglas-fir with sporadic mature to old Douglas-fir veterans. The sub-canopy contained Douglas-fir, grand fir, western red cedar, western hemlock, arbutus, red alder (*Alnus rubra*) and bigleaf maple (*Acer macrophyllum*). This area was transitional and generally became wetter towards the interior of the reserve. Crown closure was estimated to range from 50 to 60%.

A small section of the vegetation type was mapped in the south western corner of the reserve on the south side of North Road (Vegetation Type 1d). It was a disturbed area with the road to the north and logged areas to the south. Forest cover was irregular pole/sapling to young conifers with similar characteristics as 1c.

The shrub layer (percent cover of 50 to 65%) was dominated by moderate to very thick salal (*Gaultheria shallon*) with patches of dull Oregon grape (*Mahonia nervosa*) and various conifer saplings. Red huckleberry (*Vaccinium parvifolium*) occurred on old stumps and decomposing woody debris, while sporadic occurrences of bald hip rose (*Rosa gymnocarpa*), Pacific dogwood (*Cornus nuttallii*) and English holly (*Ilex aquifolium*) were observed.

Herbaceous cover was sparse in the north to moderate in the south (10 to 40%) and generally limited to sword fern (*Polystichum munitum*). Other species likely occur, but were not observed due to the time of year in which the survey was conducted. Both areas contained a thick (75 to 90%) moss layer that included Oregon beaked moss (*Eurhynchium oregonum*), step moss (*Hylocomium splendens*), electrified cat's-tail moss (*Rhytidiadelphus triquetrus*) and numerous other unidentified species.

Over time it is expected that this vegetation type will be dominated by Douglas-fir with a significant component of western red cedar and grand fir. Arbutus will continue to be a sporadic species and in many areas will die out as the conifers mature. Self-thinning will continue to result in a gradual reduction in tree density. Salal and dull Oregon grape will continue to dominate the shrub layer as a thick continuous layer. Other shrub species will occur, but are likely to be limited in number. Sword fern will form much of the herbaceous layer, but species such as vanilla leaf (*Achlys triphylla*) and bracken (*Pteridium aquilinum*) are likely to occur as well. The moss layer will contain similar species and will continue to form thick mats on the forest floor and woody debris.

3.3.2 Vegetation Type 2

Vegetation Type 2 encompassed a hummocky to near flat area (3 to 5% east) of medium textured soils in the middle of the reserve (Figure 3). Coarse woody debris in a variety of decay stages was common, however snags were relatively rare.

It was dominated by a multi-storied conifer forest of Douglas-fir and western red cedar with rare veterans. A sub-canopy of the same species with rare occurrences of arbutus was also present. Crown closure was estimated to be 60%.

The shrub layer contained a thick cover (60% of the 75% shrub cover) of salal, along with clumps of dull Oregon grape, ocean spray and western red cedar saplings. The occasional grand fir sapling and western flowering dogwood were also observed.

Herbaceous cover was sparse (percent cover of 15%) and primarily contained sword fern. Moss was abundant (percent cover of 80%) with thick mats of step moss and Oregon beaked moss occurring.

Over time this area is expected to mature into a stand of Douglas-fir with a minor component of western red cedar. Salal will continue to dominate a shrub layer that will likely not contain an abundance of species. The herb layer will contain a relatively minor amount of sword fern and is expected to contain a significant amount of bracken and other annuals such as vanilla leaf. Mosses will continue to form thick mats on the forest floor and will mainly contain Oregon beaked moss and step moss.

3.3.3 Vegetation Type 3

Vegetation Type 3 was the most common forest type found on the reserve (Figure 3). It encompassed a slight to moderately sloping (generally to the north) area of less than five percent. Soils had a moderate texture and were generally rich and moist throughout the year (Triton, 1999). Several wetlands (Vegetation Type 4 and parts of 5 and 6) and intermittent streams (including most of Stoney Creek) occurred in or adjacent to this area.

The forest stand was dominated by a mature (older second growth) multi-storied conifer stand of Douglas-fir and western red cedar (crown closure of 65%) with a minor

component of red alder and bigleaf maple. Sporadic individuals and clumps of western red cedar and Douglas-fir veterans occurred throughout the area. Western portions of the vegetation type contained younger stands with a similar composition.

Shrubs were well spaced and generally occurred sparsely (20% cover) or in small clumps due to the thick canopy cover. Western red cedar saplings, salal and dull Oregon grape were the most common species. Herbaceous vegetation was limited to a thick cover (50%) of sword fern; however, other species likely occur during the spring and summer months.

Thick mats of moss covered (85%) much of the forest floor and abundant woody debris. Common species included coastal leafy moss, Oregon beaked-moss, step moss and palm tree moss.

Wildlife trees were common throughout this vegetation type, many of which had evidence of extensive woodpecker and secondary cavity nester use. Numerous large old stumps, nurse logs and freshly fallen trees and the proximity to adjacent streams and wetlands indicated that the habitat potential for amphibians and small mammals is high.

This vegetation type is not expected to significantly change in the near future. The forest stands will continue to mature and western red cedar will likely form a larger component of the main canopy. Deciduous species will likely be shaded out in many areas, but due to the numerous wet areas and disturbances such as windthrow, patches of red alder and bigleaf maple will persist. The composition of shrubs, herbs and mosses are not expected to undergo significant change.

3.3.4 Vegetation Type 4

Vegetation Type 4 included four small wetlands scattered throughout the reserve (Figure 3). These areas have fluctuating water tables that vary on a seasonal basis. During wetter times of the years they often contain standing water whereas during the summer months they may range from mud to dry soil. All of the wetlands were located in slight depressions, and the three southern areas were either fed or drained by intermittent streams. The northern wetland did not have an apparent water source other than precipitation and groundwater.

The wetlands were characterized by a distinct lack of Douglas-fir and the occurrence of thick slough sedge (*Carex obnupta*) in open areas. Trees such as western red cedar and red alder typically occurred around the perimeter of the wetlands with rare occurrences within the wet areas in hummocks or other small raised areas. Crown closure was estimated at 35 percent, but varied considerably in the different areas.

Shrub cover was limited in most of the wetlands except the northern one. Species generally occurred in drier soils on the edges of the wetlands and included grand fir saplings, salal, red huckleberry and red alder saplings. The northern wetland contained Pacific crab apple (*Malus fusca*) and thick clumps of hardhack (*Spiraea douglasii*).

Herbaceous cover was dominated by thick slough sedge in wet areas and thick sword fern in drier portions. It is expected that bracken and lady fern also form a major component of the herb layer. Mosses were common, particularly on decaying woody debris. Species were similar to other areas of the reserve in the drier transition from adjacent forests, while wet areas contained *Kindbergia praelonga*.

The wetlands contain excellent habitat features that are locally uncommon. Although considered to be intermittent, these areas provide important food sources for many avian species and are likely inhabited year round by a variety of small mammals and amphibians.

Due to the persistently wet soils and fluctuating water tables it is expected that the wetlands will not undergo significant change in the near future. They may decrease slightly in size as the adjacent forest stands mature and encroach on the wetlands; however, as observed in large areas of Vegetation Type 6, there is the potential for extensive wind throw. The combination of wet, thin soils and canopy openings create the ideal conditions for a natural disturbance of this type and may assist in the wetlands persistence.

3.3.5 Vegetation Type 5

Vegetation Type 5 encompassed a mosaic of ecotypes from mature to old conifers on slightly elevated sites, to mature maple and young red alder in wet depressions along intermittent streams and wet areas, to areas with fluctuating water tables with similar characteristics to Vegetation Type 4 (Figure 3). In general, the area sloped gradually (5 to 10%) to the north east and was characterized by rich, wet soils.

Forest stands were dominated by an irregular cover (40%) of mature conifers with sporadic veteran Douglas-fir and western red cedar. Pockets of young red alder were common in wet depressions and along the streams, while big-leaf maple was largely absent.

Shrubs formed a thick cover (60%) throughout the area. Dominant species included salal and western red cedar and Douglas-fir saplings. Other species that occurred sporadically included salmonberry (*Rubus spectabilis*), Pacific dogwood, red huckleberry and trailing black currant (*Ribes laxiflorum*).

The herb layer was also thick (50% cover) and primarily contained sword fern and deer fern (*Blechnum spicant*), with patches of slough sedge along streams and in wet depressions. This area likely contains a high diversity of herbaceous vegetation due to the rich soils and multiple ecological conditions.

Mosses also formed a thick (50% cover) layer on the forest floor and decaying woody debris. Oregon beaked-moss and step moss were the most common species, while electrified cat's-tail moss occurred in drier areas and coastal leafy moss (*Plagiomnium*

insigne) and palm tree moss (*Leucolepis acanthoneuron*) was found in moist environments.

Due to the variety of ecotypes, abundance of woody debris and snags, and presence of water through out much of the year, potential wildlife habitat is high. In particular, amphibian and avian habitat was observed.

Over time it is expected that this area will continue to contain a variety of ecotypes. Douglas-fir and western red cedar are expected to remain as the dominant tree species, while patches of deciduous species will persist in wet areas and along the watercourses. There is a potential for significant wind throw as was observed in similar areas in Vegetation Type 6.

3.3.6 Vegetation Type 6

Vegetation Type 6 was similar to type 5 in that it contained a mosaic of ecotypes ranging from mixed young to mature forests, frequent seepage areas and well defined wetlands (Figure 3). Most of the area was situated in a hummocky depression that drained into Stoney Creek to the east. Upland regions, mainly to the north and west gently sloped to the north and east.

The majority of the vegetation type was distinct from the rest of the reserve in its total lack of Douglas-fir. The canopy was dominated by an irregular to two-storied stand (40% cover) of grand fir, western red cedar and red alder interspersed with frequent openings which contained wetlands or areas with fluctuating water tables. Several well spaced veteran western red cedars occurred throughout the area.

Shrubs were largely absent, with cedar saplings the most common species. Other species included red huckleberry, salal and red elderberry (*Sambucus racemosa* ssp. *pubens*). Herbaceous vegetation was thick (up to 95% cover) and was dominated by various hydrophytes including slough sedge, small flowered bull rush (*Scirpus microcarpus*), common rush (*Juncus effusus*) and three-way sedge (*Dulichium arundinaceum*). Sword fern formed a thick cover outside of wet depressions.

Mosses were sparse (20% cover), but occasionally occurred in large clumps on woody debris and elevated areas. Species included Oregon beaked-moss and step moss.

Drier sites occurred on the boundaries of the wetlands and wet forests. These areas were characterized by a young to mature irregular stand (50% cover) of Douglas-fir, western red cedar and red alder with occasional grand fir. The shrub layer was much more developed (45% cover) then in the wetter portions of the vegetation type. Common species included salal, dull Oregon grape and western red cedar saplings.

Herbaceous vegetation was thick (55% cover) and dominated by a well spaced cover of sword fern. The moss layer was also extensive (65% cover) and formed thick mats on the

forest floor and woody debris. Species included Oregon beaked-moss, step moss and coastal leafy moss.

As with Vegetation Type 5, the multitude of ecotypes was considered conducive to a variety of wildlife. In particular, opportunities for excellent amphibian and avian habitat were observed.

Vegetation Type 6 contained large areas of recent cedar and alder wind throw. This disturbance was observed in wet seepage areas and was likely influenced by permanently saturated thin soils. It is expected that this area will undergo additional major disturbances in the future that will significantly change the stand structure by creating large openings in the canopy. Open areas may be re-colonized by existing deciduous and conifer species, but will likely remain as wet, shrub/herb dominated areas for some time.

3.3.7 Vegetation Type 7

Vegetation Type 7 included two small open areas to the immediate north of North Road (Figure 3). Both areas were accessible (and well used) from North Road by vehicles. The open areas were dominated by low shrubs and herbaceous vegetation. Scotch broom (*Cytisus scoparius*) was extensive throughout the western area and occurred to a lesser extent in the eastern clearing. The dominant species in both areas was various types of grass, many of which were likely introduced. Reed canarygrass (*Phalaris arundinacea*) was observed in the western clearing.

Unless vehicle access is prohibited and efforts are taken to control invasive species, it is likely that these areas will remain in a similar state in the foreseeable future. If vehicles are restricted then natural regeneration of forest stands similar to that found in Vegetation Type 1c is expected.

3.4 Invasive Species

Five invasive weeds were identified on the reserve (Table 2). In addition to the identified species, it is likely that numerous other herbaceous species (such as the unidentified grass and thistle species) are present along the trail system, rocky outcrops in the north and the disturbed areas adjacent to North Road. Spring and summer inventories are required to create a comprehensive list of species and their respective locations.

Table 2. Invasive Floral Species

Common Name	Scientific Name	Severity	General Locations
English holly	<i>Ilex aquifolium</i>	Low	Forested areas in the south west of the reserve.
English ivy	<i>Hedera helix</i>	Low	Forested areas along the eastern property line.
reed canarygrass	<i>Phalaris arundinacea</i>	Low	Open disturbed area immediately north of North Road.
Scotch broom	<i>Cytisus scoparius</i>	Moderate	Open disturbed areas immediately north of North Road and adjacent

			properties to the west.
thistle species		Low	Wet areas in the south west corner of the reserve.

The following section prioritizes the identified invasive species based on the severity (how well established) of the species, the ability of the species to become further established in the reserve (based on existing and predicted ecological conditions), and the potential impact of the species on native biodiversity. Using those criteria, the invasive species have been categorized as high, medium and low priority in terms of the need for active management.

High Priority Species

- *Reed canarygrass*. This highly invasive species was observed in an open disturbed area (Vegetation Type 7) north of North Road. It was also observed in many nearby areas outside of the reserve. Reed canarygrass has little wildlife value and is capable of out-competing native vegetation as thick monocultural mats. Although not widely observed, it has the potential to become a dominant species in many of the wet areas throughout the reserve.
- *Scotch broom*. Broom was observed in the two open disturbed areas (Vegetation Type 7) immediately to the north of North Road and in adjacent properties to the west. There is high potential for this species to become established in the dry northern portions of the reserve, particularly in the open rocky areas. This species has the potential to out-compete native vegetation and form thick monocultures. It produces millions of seeds that remain viable in the soil for years. It is expected that over time most of the broom will die out as forest stands mature and reduce available light.

Medium Priority Species

- *English holly*. Holly was observed in two locations in the southwest of the reserve. While it was limited to individual small shrubs, there is potential for it to become established throughout the reserve, particularly due to the high avian population in the area. English holly out-competes native vegetation and readily reproduces via root suckers and berries that are often spread by birds. Although a valuable avian food source, the bright red berries are poisonous to humans (Municipality of Saanich, 2006).
- *English ivy*. Ivy was found in thick mats on two large trees along the eastern property line. English ivy is a non-native vine that can form thick mats and smother low growing native vegetation. It can also creep up the trunk of trees and make them more vulnerable to damage from wind caused by the weight of the ivy on branches. In severe cases, the ivy can smother the tree and shade it from photosynthetic light (Municipality of Saanich, 2006).

Low Priority Species

- *Unidentified thistle species*. As the species of thistle could not be identified, it is not known if it will become a problem. Thistles were found in a single location on the reserve, but likely occur in other areas.

Methods of Introduction and Distribution

Invasive species are introduced and spread via a variety of vectors. Many species are common pioneer species that become established in exposed soil after disturbances. Others are introduced from a variety of sources, such as recreational users (hikers, horses, dogs, ATVs, etc.), wildlife, and birds.

3.5 Rare Plants, Animals and Ecological Communities

At least two rare species are likely to occur on the reserve (Table 3). They were observed by Triton Environmental Consultants in 1996 in the area, but do not necessarily inhabit the reserve. There is a high potential for occurrences of red-legged frog in the reserve as it contains excellent habitat (numerous water sources and mature conifer forests for foraging).

Table 3. Rare Animals

Common Name	Scientific Name	BC Status	BC List	COSEWIC Status
band-tailed pigeon	<i>Patagioenas fasciata</i>	S3S4B	Blue	
red-legged frog	<i>Rana aurora</i>	S3S4	Blue	Special Concern (2004)

Four rare ecological communities occur on the reserve based on BEC site series identified on the reserve (Table 4) (BC Conservation Data Centre, 2006). Due to the relatively rare occurrence of similar mature forests in the Coastal Douglas-fir Zone, the preservation of this area is significant.

Table 4. Rare Ecological Communities

Site Series	Common Name	Scientific Name	BC Status	BC List	Veg. Type(s)
CDFmm/01	Douglas-fir / dull Oregon-grape	<i>Pseudotsuga menziesii</i> / <i>Mahonia nervosa</i>	S2	Red	1
CDFmm/05	western red cedar - Douglas-fir / Oregon beaked-moss	<i>Thuja plicata</i> - <i>Pseudotsuga menziesii</i> / <i>Eurhynchium oreganum</i>	S1	Red	2
CDFmm/11	red alder / skunk cabbage	<i>Alnus rubra</i> / <i>Lysichiton americanus</i>	S2S3	Blue	6
CDFmm/14	red alder / slough sedge [black cottonwood]	<i>Alnus rubra</i> / <i>Carex obnupta</i> [<i>Populus balsamifera</i> ssp. <i>trichocarpa</i>]	S1	Red	4, 5, 6

3.6 Wildlife and Wildlife Habitat

A comprehensive inventory was beyond the scope of the management plan inventory. Table 5 presents a list of confirmed species found in the general area during Triton Environmental Consultant's 1996 study. The reserve was a large portion of their study area and in close proximity to other areas in which observations were made. Therefore, although the presence of these species can not be certain, they are very likely to inhabit or utilize the reserve.

Table 5. List of Wildlife Species

Common Name	Scientific Name
Mammals	
black-tailed deer	<i>Odocoileus hemionus columbianus</i>
deer mouse	<i>Peromyscus maniculatus</i>
red squirrel	<i>Tamiasciurus hudsonicus</i>
Amphibians	
red-legged frog	<i>Rana aurora</i>

The reserve contains an abundance of excellent wildlife features. Significant features include, but are not limited to:

- a variety of aquatic environments including wetlands, seepage sites and intermittent streams;
- an abundance of coarse woody debris of all size and decay classes;
- numerous snags and trees in various states of decay;
- mature and old conifer and deciduous trees; and
- dry rocky outcrops.

These habitat features provide potential opportunities for a large variety of small mammals, reptiles, and amphibians.

3.7 Bird Species

As with the previous section, Table 6 contains a list of avian species identified in the general area reported in the 1996 report by Triton Environmental Consultants.

Table 6. List of Bird Species

Common Name	Scientific Name	Common Name	Scientific Name
American kestrel	<i>Falco sparverius</i>	Pacific-slope flycatcher	<i>Empidonax difficilis</i>
American robin	<i>Turdus migratorius</i>	pileated woodpecker	<i>Dryocopus pileatus</i>
bald eagle	<i>Haliaeetus leucocephalus</i>	red crossbill	<i>Loxia curvirostra</i>
band-tailed pigeon	<i>Patagioenas fasciata</i>	red-breasted nuthatch	<i>Sitta canadensis</i>
black swift	<i>Cypseloides niger</i>	red-breasted sapsucker	<i>Sphyrapicus ruber</i>

brown creeper	<i>Certhia americana</i>	rufous hummingbird	<i>Selasphorus rufus</i>
bushtit	<i>Psaltiriparus minimus</i>	solitary (Cassin's) vireo	<i>Vireo cassinii</i>
chestnut-backed chickadee	<i>Poecile rufescens</i>	song sparrow	<i>Melospiza melodia</i>
common nighthawk	<i>Chordeiles minor</i>	spotted (rufous-sided) towhee	<i>Pipilo maculatus</i>
common raven	<i>Corvus corax</i>	Steller's jay	<i>Cyanocitta stelleri</i>
common yellowthroat	<i>Geothlypis trichas</i>	Swainson's thrush	<i>Catharus ustulatus</i>
dark-eyed junco	<i>Junco hyemalis</i>	turkey vulture	<i>Cathartes aura</i>
downy woodpecker	<i>Picoides pubescens</i>	western tanager	<i>Piranga ludoviciana</i>
golden-crowned kinglet	<i>Regulus satrapa</i>	western wood-pewee	<i>Contopus sordidulus</i>
hairy woodpecker	<i>Picoides villosus</i>	white-crowned sparrow	<i>Zonotrichia leucophrys</i>
hermit thrush	<i>Catharus guttatus</i>	Wilson's warbler	<i>Wilsonia pusilla</i>
northern flicker	<i>Colaptes auratus</i>	winter wren	<i>Troglodytes troglodytes</i>
northwestern crow	<i>Corvus caurinus</i>	yellow warbler	<i>Dendroica petechia</i>

The reserve contains a variety of features conducive to avian use. Significant features include dense shrubby areas adjacent to wetlands, to an abundance of decaying snags suitable for woodpeckers and cavity nesters, to numerous veteran trees. Due to the wide variety, it is assumed that most if not all of the previously listed avian species inhabit or utilize the reserve for all or part of the year.

4.0 Public Information Session and Input

A public consultation meeting on the management of the Elder Cedar (S'ul-hween X'pey) Nature Reserve was held on the afternoon of December 2nd, 2006 at the Women's Institute Hall on Gabriola Island. The meeting was advertised in the local community newspapers, the Gabriola Sounder and the Shingle, November 20th and 27th and additional notices were posted at key locations throughout the community. In addition, personal invitations were sent prior to the meeting to Islands Trust Fund local trustees and staff, Regional District of Nanaimo, members of the Gabriola Conservancy, Gabriola Lands and Trails Trust, Islands Trust planning staff, Snuneymuxw First Nation, Rod and Gun Club, Fire District and Gabriola Rescue of Wildlife Society through electronic correspondence or by telephone.

The meeting was attended by twenty-one individuals, in addition to two staff members from Taara Environmental and a staff member of the Islands Trust Fund. A display of materials regarding information on the reserve's history and significant features, an aerial photograph and ecological maps of the reserve were presented and attendees were given the opportunity to provide input at the meeting, as well as by submitting a survey (attached as Appendix B) both at the meeting, and alternatively from the project website. Written comments were received until January 22nd, 2007 and forty-four submissions

were received. In addition, the public was asked to submit name suggestions for the reserve. Twenty-six name suggestions were provided to the Islands Trust Fund for their consideration.

In general, community and stakeholder input was favourable toward the acquisition of the Elder Cedar (S'ul-hween X'pey) Nature Reserve and its protection as such. The community expressed varying perspectives on the future use and management of the reserve, with several individuals expressing a desire to allow for horse use and mountain biking along the northern boundary (to allow for recreational access to adjacent federal lands) and equal number expressing that the reserve be accessed for pedestrian use only.

5.0 Management Plan

The following section provides an overview of the management issues as identified by the consultant, the Islands Trust Fund, residents and additional stakeholders as identified in Section 4.0 above, and provides options and management strategies to address those issues.

5.1 Issues and Discussion

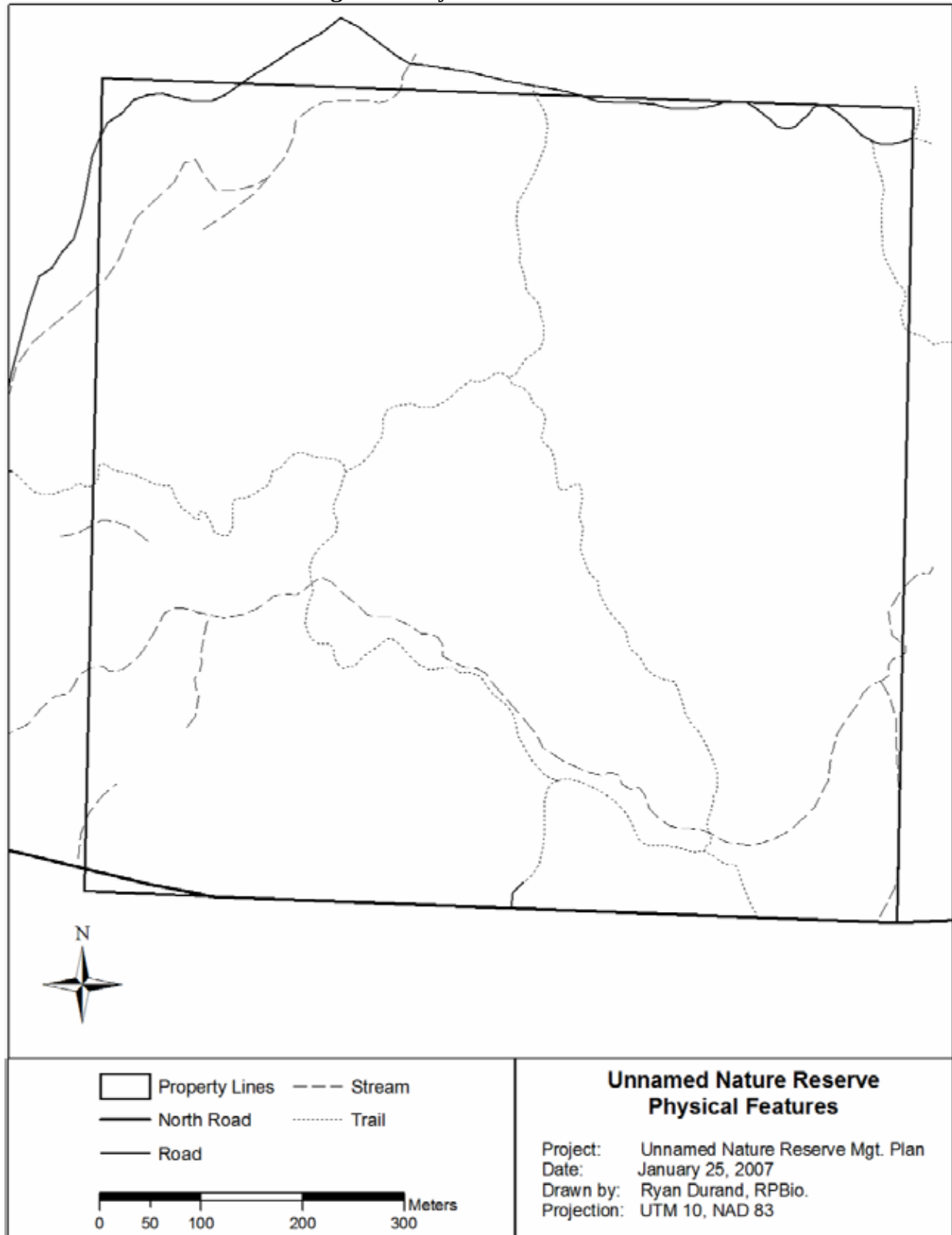
Based on input from the community and sources as listed in Section 4.0, the following management issues regarding the Elder Cedar (S'ul-hween X'pey) Nature Reserve have been identified:

- Trail use and location
- Trail maintenance and safety
- Permitted uses
- Exotic and invasive species
- Illegal dumping
- Salal picking
- Protection of sensitive eco-systems and species at risk
- Fire management
- Education and research
- Capacity

5.1.1 Trail Use and Location

Currently there are several access points and trail systems leading into and out of the Elder Cedar (S'ul-hween X'pey) Nature Reserve from adjacent properties and from North Road and Windecker Road with varying levels of use. The majority of the trail system consists of narrow foot paths that constructed by pedestrians, horseback riders and mountain bikers, as well as old logging roads. Several of these trails cross over streams and wetlands. Some of the trails also contain mountain bike infrastructure and stunts, some of which are in varying states of deterioration.

Figure 4. Physical Features



Several of the existing trails within the reserve are of concern due to their location within sensitive areas and/or the routes crossing over or onto private property or federal land holdings. Staff of the Snuneymuxw Treaty office voiced concern over the use of these lands by the public until the future of these lands has been determined.

There are two trail systems that enter the reserve from North Road. The most easterly of these trails is considered to be the most utilized by the public (photo point 1) and has some parking availability due to an old road and pull out at the entrance. A sign should be posted at the main entrance welcoming visitors and stating permitted uses of the reserve. The second trail leading from North Road was less used and had been used for the dumping of yard waste. This trail was also a site with numerous invasive species (photo point 20). It is recommended that this second trail be closed to public use and some remedial action take place to remove established invasive species and to remove any yard trimmings that have been discarded in this location. Signage could be installed indicating that the trail has been closed or alternatively the trail could be blocked by obstacles such as downed wood or boulders to deter its future use.

The main trail makes a loop within the reserve and forks just before crossing Stoney Creek in the southern portion of the reserve (photo point 2). The trail heading northward crosses over Stoney Creek a short distance from where the main trail junction is located. A stream crossing is required at this location (photo point 3) and should be constructed to protect riparian values. Soils along intermittent streams can be vulnerable to erosion from recreational traffic. Further along this portion of the trail system are several mountain bike improvements that should also be removed to discourage their use (photo points 7 and 8). These were generally small stunts constructed of pieces of lumber five meters long. Considerable damage to the trail system has been incurred by mountain bike use at the trail junction found at photo point 10. It may be necessary to narrow the trail at this junction to avoid further braiding and compaction of soils in this area. The use of obstacles such as downed logs along the trail may encourage users to stay within the desired trail.

A second trail (also well used) leads from the junction found at photo point 11 to the northern property line, where it meets an old logging road that runs the length of the northern property line veering on and off of reserve lands and federal land holdings. Signage indicating that users are leaving the reserve and entering federal lands should be erected at this location (photo point 34). This trail is wetted for parts of the year and braiding of the trail has occurred in areas where users have tried to bypass wetted areas (photo point 36). It may be necessary to close this trail during the wet season (typically winter months) to reduce damage to soils from recreational use. When and if resources permit, it may be necessary to install a boardwalk in areas of the reserve where the trail system is wetted for parts of or all of the year. This would protect the thin soils and root systems that are currently being damaged by recreational use.

The main loop trail leads from the junction at photo point 11 towards the southwest, where it makes another stream crossing over Stoney Creek. An additional stream crossing is required in this location to protect the riparian area surrounding this creek. Additional mountain bike improvements along this portion of the trail system also require removal (photo points 12 and 13). These include three stunts and a stream crossing constructed of small pieces of lumber approximately five to ten meters long.

A small footpath leads off of the loop trail approximately half way to this second stream crossing, which leads to the federal land holdings along the western boundary of the reserve (photo point 41). This trail is narrow and not well utilized and crosses over a significantly wet area. It is recommended that this trail be closed to public use, as it was expressed that there was concern over the public using these lands for recreational purposes by staff of the Snuneymuxw Treaty office until the future use of the federal lands has been determined. It is likely that this trail would eventually become overgrown on its own accord after continued lack of use.

The main loop trail leads back toward the main entrance after it crosses over Stoney Creek at photo point 13. Shortly after the stream crossing, the trail leads through a wetted area, where erosion and tree root damage is occurring (photo points 14 and 16). This area may also require a board walk to protect the thin soils from further damage, similar to that experienced in the northern portion of the reserve at photo point 36. The trail also leads in close proximity to the edge of the creek at photo point 18, which has high potential for erosion. It is recommended that the trail be relocated slightly aback from the riparian area; with consideration to the wetland to the south, to protect the stream from sedimentation and damage.

An old logging road crosses over the northern property line and is blocked at its eastern entrance. Vehicle access can still be obtained from federal land holdings to the north of the reserve. A portion of the road crosses over the reserve at its northwestern corner (photo points 39 and 40) and its northeastern corner (photo points 30 and 34). Use of the road by recreational vehicles was observed at all locations of the road within reserve boundaries and additionally along rocky outcrops in proximity to the road. Vehicle usage within the reserve is strictly prohibited and signage should be erected at both eastern and western portions of the road that enter reserve lands (photo points 30, 39, 34 and 40). Additionally, the road is used by cyclists and horseback riders connecting to the trail system leading onto federal lands. When the future use of the federal lands has been determined, the use of this road system through the reserve by cyclists and horseback riders will be re-examined. The use of the trail leading from Windecker Road to this same road system will also be re-examined at that time. Pedestrian use of those portions of the road and trail within reserve boundaries is permitted to continue. Signs may be erected where the road enters federal lands to inform users that they are leaving Elder Cedar (S'ul-hween X'pey) Nature Reserve lands.

The whole of the reserve contains thin soils and exposed roots that are vulnerable to erosion and compaction, as well as large areas that are wetted for part or all of the year. Considerable damage to the root system of trees was observed throughout the reserve due

to high recreational traffic. Although pedestrian use of the reserve is permitted, it is recommended that the reserve not be further promoted as a recreational destination within tourist and local literature. Increased foot traffic or other types of recreational use of the trail system will have long term detrimental effects on the natural integrity of the reserve. It is not realistic that the trail system as a whole could be protected by built structures, such as boardwalks, nor is it desirable. In wetted areas that have received considerable damage and are considerably vulnerable to foot traffic, the use of built structures may be desirable and necessary as recommended above. These may be built as resources permit.

5.1.2 Trail Maintenance and Safety

Trail maintenance and safety includes the clearing of brush along trails, the removal of downed trees across trails, maintenance of stream crossings and boardwalks (when and if constructed) and other actions as deemed appropriate and necessary to keep trails cleared and safe for pedestrian use.

Gabriola Island receives heavy rains and winds at certain times of the year, which may result in downed trees, as well as increased trail vulnerability to erosion. During the winter months, trails may be impassable due to wind or water damage. Periodic monitoring of trail conditions by local recreational users or by Islands Trust Fund staff should occur at a minimum of once a year. Additionally, signage at key access points to the Elder Cedar (S'ul-hween X'pey) Nature Reserve should provide a contact number for users of the site to report any unsafe conditions so that remedial action can occur.

In localized areas of the Elder Cedar (S'ul-hween X'pey) Nature Reserve, rain during the winter months, results in periodic flooding of parts of the trail system. Often, users of a trail will bypass areas that experience periodic flooding and cause the trail system to widen at those locations causing soil compaction and damage to adjacent vegetation. To address this issue, portions of the trail may be required to be closed to public use during the wet season. These areas include portions of the trail system at photo point 36, where the trail is braided to avoid wet areas and that portion of the trail running along side the stream between photo points 13 and 14. Alternatively, as resources permit, these portions of the trail could be better developed and a boardwalk installed to protect the soil from compaction.

Another issue experienced during heavy rains and winds is blow down of trees across trails, which can increase the safety hazard to trail users and in specific circumstances deem a trail impassable. In instances where blow down has occurred and the trail has been made impassable, it is recommended that only that part of the tree that lies across the trail is removed and that the remainder of the tree is left as it lies to further contribute to the biodiversity of the reserve as downed woody debris, if deemed safe to do so. Downed woody debris contributes to biodiversity by providing cover for small mammals and amphibians and adding to structural diversity in the forest ecosystem.

5.1.3 Permitted Uses

Based on public input and consultation with local stakeholders, the following activities will be permitted to continue within the Elder Cedar (S'ul-hween X'pey) Nature Reserve. Permitted activities are considered to be low impact and are deemed compatible with the intent of the Elder Cedar (S'ul-hween X'pey) Nature Reserve and the protection of its ecological features and attributes. If one or more of these activities is observed to cause damage or no longer meets the intent of the Elder Cedar (S'ul-hween X'pey) Nature Reserve, the Islands Trust Fund reserves the right to re-examine the activity and prohibit its use, if warranted, in the future. If an activity or use is not mentioned below, then it is considered to not be a permitted use of the reserve and as such is prohibited within reserve boundaries.

Access to adjacent federal lands for horses and cyclists by way of the northern trail system was requested by several local residents. These lands are currently being held as Treaty settlement lands for the Snuneymuxw First Nation. It is not the intent of this management plan to encourage trespass on adjacent federal land holdings. When and if the Snuneymuxw First Nation agrees to allow for public recreational use of their lands, the use of the northern trail system by cyclists and horses will be re-examined.

Pedestrian Use

Pedestrian use of the trail systems within the reserve will be permitted to continue. This activity includes walking, as well as access by wheelchairs or other devices used by those with motor impairments. Trails may not be maintained to a standard that allows access to all parts of the reserve. Pedestrian use will be restricted to established trails, unless signs otherwise indicate trail closure.

Wildlife Viewing and Photography

Wildlife viewing includes bird watching, botany or the study of plants within the reserve. Bird watching and nature appreciation is a popular activity and can contribute substantial knowledge of the wildlife and plant species utilizing the reserve. The removal or relocation of plants, animals and/or other animate or inanimate objects from reserve boundaries is strictly prohibited unless removed or relocated with the written permission of the Islands Trust Fund.

Nature photography, much like wildlife viewing and nature appreciation, is growing in popularity and is considered to be a low impact activity. This activity is expected to grow as the natural attributes of the reserve continue to mature and assume old-growth characteristics, providing more unique images.

Dog Walking (leashed)

Pedestrian use of the Elder Cedar (S'ul-hween X'pey) Nature Reserve has permitted dogs in the past. This activity will be permitted to continue provided that dogs remain on leash at all times and that dog feces is picked up and deposited off-site. Facilities for dog walkers will not be provided for on site and signage will indicate that dogs must be on leash at access points and will provide reasons for this restriction. If it is observed that

dog walkers are allowing their dogs to run free within the reserve boundaries, the Islands Trust Fund reserves the right to prohibit all dog access in the future.

Traditional Gathering and Use

The use of the reserve by First Nations for traditional gathering of medicinal plants and other foods or materials will be permitted to continue.

5.1.4 Exotic and Invasive Species

A comprehensive list of exotic and invasive species as observed during field visits and from past literature is included in Table 2 of this report. In addition, a general discussion of priority species is included in Section 3.4. This section will discuss in more detail management options for those species listed as high to medium priority. An unidentified thistle species is listed as low priority and will not be addressed further in this report. This species is assumed to be adequately managed by natural succession, as this shade intolerant plant is found in low quantity throughout the reserve.

The following section explores removal methods for the high and medium priority species within the Elder Cedar (S'ul-hween X'pey) Nature Reserve. Because the intent of the Nature Reserve is to protect native plants and biodiversity, biological and chemical control has not been included in this discussion. In addition, exotic and invasive species must be disposed of as carefully as they are removed to avoid their spread and establishment in other locations. Local disposal facilities should be sought with expertise in the handling of invasive plant material. It is not advisable that removed plants be composted.

English Holly (Ilex aquifolium) and Scotch Broom (Cytisus scoparius)

Scotch broom was considered to be moderately established in the reserve; however, it has the potential to become a more widespread problem. This species fixes its own nitrogen and is prolific in open areas and long lived in the seed bank.

English holly spreads through the suckering of its root system or by berries transported by wildlife. It was not considered to be well spread within the reserve. Berries are poisonous if ingested. Young plants can be mistaken for native dull Oregon grape. Methods of removal are similar to that of Scotch Broom.

Removal of both species is best done in the late summer or early winter before the plant goes to seed. Young plants can be hand pulled. Larger plants require cutting below the root crown with either loppers or a pruning saw. Because English holly can spread via its berries, and Scotch broom can leach toxins and suppress native plant growth, it is recommended that removed plants and debris is piled on tarps and carefully removed. Care and consideration should be taken to avoid disturbance of soil during removal (Municipality of Saanich, 2005).

English Ivy (Hedera helix)

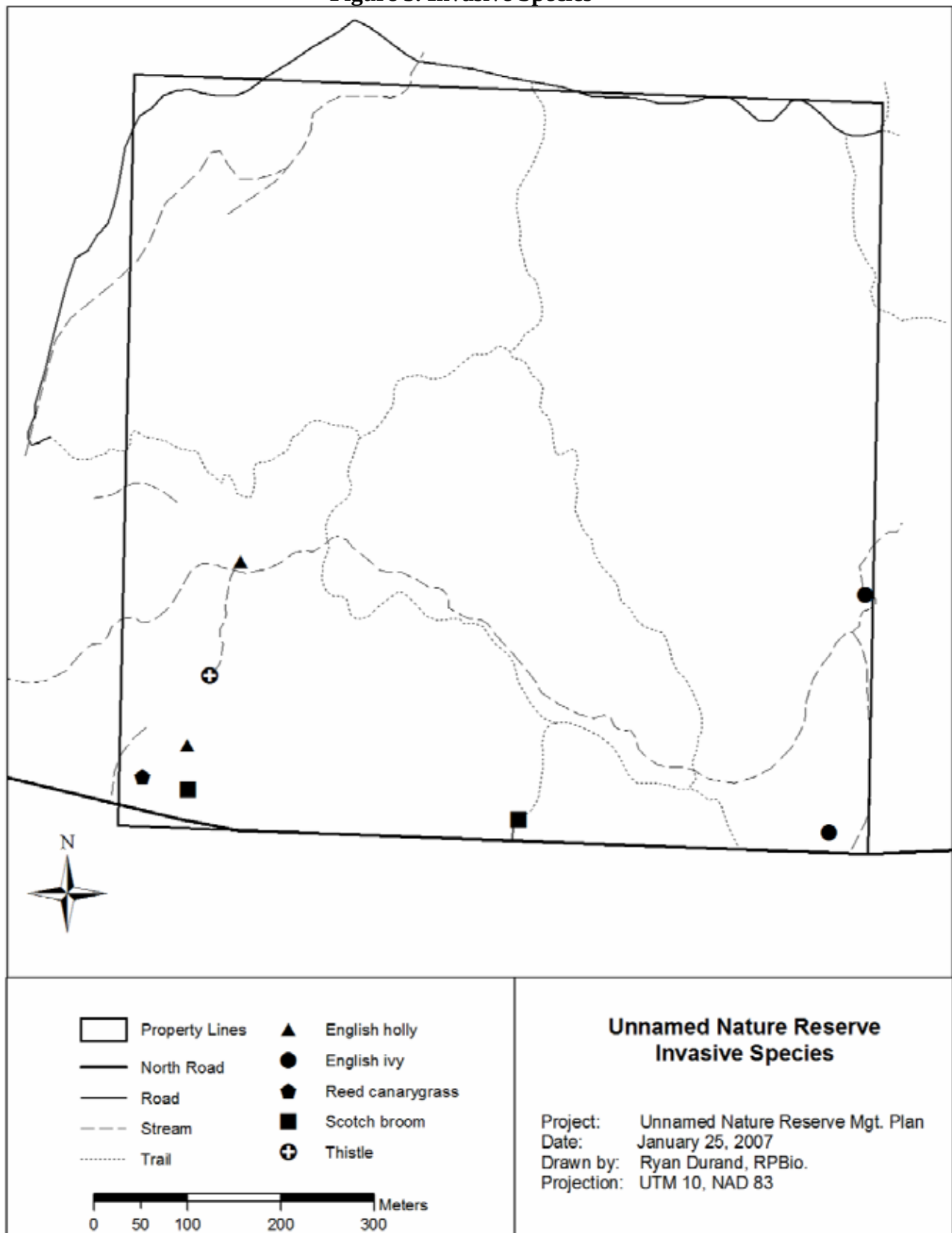
English ivy was observed along the eastern property line. Although not found to be well distributed within the reserve, this species if left unattended, has the potential to damage native trees and low lying vegetation.

Smaller plants can be removed by hand pulling and careful removal of the root system. Plants found on the trunks of trees are the first priority and can be removed by hand lopping the vines at chest height around the entire trunk of the tree and then pulling them. Because this species can easily re-establish itself from residual parts of its root system or leaves, removal requires frequent visits. Similar to English holly and Scotch broom, removed plants should be piled on tarps and disposed of at an approved facility. Composting of this species is not recommended (Municipality of Saanich, 2005).

Reed Canarygrass (Phalaris arundinacea)

In British Columbia, reed canarygrass is primarily of the native variety, although it is difficult to distinguish from European varieties. Reed canarygrass grows vigorously, but is not yet well established in the reserve. Control methods for Reed canarygrass include burning, covering of the plants to deplete oxygen and mowing, none of which have been proven to be highly successful. Due to the potential damaging effect these methods may have on existing native species, they will not be considered further. Hand pulling in small areas can be effective if done several times a year for a series of five years. This may be a practical means of removal before this species can become more established (Canadian Wildlife Service, 2003). Recent findings from the Invasive Plant Council of BC suggest shading the plants with trees and repeatedly using weed-whipping to weaken the grass until the trees have grown sufficiently.

Figure 5. Invasive Species



5.1.5 *Illegal Dumping*

Illegal dumping of yard wastes and garbage was reported by several residents and was observed along the most easterly of the entrances to the reserve from North Road. Signage indicating that dumping is prohibited could be erected at the entrance to this trail in addition to notification of its closure. In addition, written notice of dumping and documentation should be provided to the local Islands Trust bylaw enforcement officer who may be able to file the complaint and investigate the matter further in cooperation with other responsible agencies, such as the Ministry of Transportation and Highways.

Yard wastes should be removed as soon as possible due to the potential for the introduction of exotic plant species from these wastes. Periodic monitoring of the property for dump sites should be included within the annual monitoring route and contact information included for residents and recreational users to report dumping to the Islands Trust Fund should be included in signage at the main entrance.

5.1.6 *Protection of Sensitive Eco-systems and Species at Risk*

There are two blue-listed species known to occur in the Elder Cedar (S'ul-hween X'pey) Nature Reserve or have the potential to exist within the reserve based on observations of adjacent properties. These include band-tailed pigeon and red-legged frog. There are no known occurrences of rare flora species within the reserve, but a more comprehensive summer inventory of plant species may result in the identification of rare species.

Band tailed pigeon is a species which prefers mature conifer forest for nesting and foraging. Protection of the existing mature forest systems and allowing younger stands to mature will allow for this species to persist. If neighboring properties are managed to allow for mature forest systems to develop, additional habitat for this species may become available.

Conservation of the riparian areas and wetlands within the reserve are of the utmost importance for the protection of red-legged frog. The construction of stream crossings over Stoney Creek and the protection of seepage areas by constructing boardwalks or limiting foot traffic in these areas during the vulnerable winter months will protect the integrity of the habitat required for this species, as well as protect groundwater and surface water resources. Riparian areas generally contain the highest biodiversity values and are vital for the survival of many species, such as amphibians and small mammals that require a variety of habitat types for their lifecycles.

The root structure of many of the veteran trees have been compacted and damaged from recreational traffic. It may be necessary to block access to these trees to protect them over the long term if damage continues. Signage indicating the sensitivity of these trees to damage could be erected along the trail system to educate the public and encourage recreational users to stay on the trail system.

Rocky outcrops within the reserve add to structural biodiversity within the reserve and may potentially contain rare or threatened flora. These sites are currently threatened by the establishment of invasive species and have been disturbed by all-terrain vehicles. Obstructions to exclude recreational vehicles from entering these areas may be required. The eastern entrance of the old logging road has already been blocked off to vehicle traffic. A similar obstacle may be required where the road enters the reserve from the west if signage is not adequate.

5.1.7 Fire Management

The Elder Cedar (S'ul-hween X'pey) Nature Reserve is located close to residences along its eastern boundary. For reasons of public safety and health, fires within the reserve will not be permitted to burn. Fire protection is provided for by the Gabriola Island Volunteer Fire Department and the British Columbia Forest Service.

5.1.8 Education and Research

Research contributes to the knowledge required to adaptively manage our natural heritage and to observe when human activity is negatively impacting natural heritage values. Although the Islands Trust Fund manages its properties to be in as natural a state as possible, permitted recreational activities and adjacent land uses can result in negative impacts. Educational and research activities will be permitted within the Elder Cedar (S'ul-hween X'pey) Nature Reserve provided that such research meets the intent and purpose of the Elder Cedar (S'ul-hween X'pey) Nature Reserve and does not result in harm to natural heritage values within reserve boundaries. The Islands Trust Fund will be notified of all research activities that take place on the property.

5.1.9 Capacity

The Islands Trust Fund has limited staffing capabilities to undertake long term management of the properties it owns and has in the past relied heavily upon local groups and organizations to undertake management and monitoring activities under various partnership arrangements. The Gabriola Conservancy has provided the leadership for the protection of the Elder Cedar (S'ul-hween X'pey) Nature Reserve; however it may not be in a position to undertake active management responsibilities within the reserve. Community members have voluntarily maintained trails on this property and throughout Gabriola Island and may be able to provide support in maintaining the trails within the reserve.

Monitoring of Islands Trust Fund properties occurs on an annual basis and a proposed monitoring route is included as an appendix to this report. Yearly monitoring of this property is deemed adequate to assess the success and/or lack of success of most proposed management actions. A phone number which the Islands Trust Fund can be contacted in specific circumstances where safety hazards and/or damage to areas of the Elder Cedar (S'ul-hween X'pey) Nature Reserve have been observed by users of the site

will allow for those issues to be addressed outside of the annual monitoring schedule as the need arises and will reduce the need for frequent staff visits.

In regards to the implementation of management actions, such as the relocation of trails and invasive species removal, alternative volunteer labour should be sought. This could include utilization of secondary school or college students in nearby communities on Vancouver Island. Students are often eager volunteers in their own communities and practical experience in the field is often a positive benefit to round out curriculum in biology, forestry or geography. Snuneymuxw First Nation may also be interested in providing opportunities for its youth to acquire the skills required for trail construction and plant removal. Supervisory staff would be required to teach these skills, and equipment would need to be provided.

5.2 Management Strategies

The following section outlines the priorities for management and recommendations as outlined above. General management direction for the Elder Cedar (S'ul-hween X'pey) Nature Reserve is to allow for natural ecological processes to continue without human intervention unless intervention is required for safety reasons.

Immediate Management Strategies

Immediate management strategies are intended to be completed within one year; or as soon as resources permit.

Action Item 1: Seek long term additional capacity and funding to ensure management recommendations for the Elder Cedar (S'ul-hween X'pey) Nature Reserve and surrounding environments can be implemented. This could be in the form of a 'Friends of Elder Cedar Nature Reserve' initiated by the Islands Trust Fund.

Action Item 2: Erect signage at access points off of North Road, Windecker Road, and federal land holdings to the north and west of the reserve (photo points 1, 20, 28, 30 and 34) indicating permitted uses. Five signs are required in total and should indicate that users are entering the Elder Cedar (S'ul-hween X'pey) Nature Reserve and show symbols for permitted uses within the reserve, as well as the Islands Trust Fund logo and a contact number to report any safety hazards or other concerns. In addition, a sixth sign, indicating that users are leaving the reserve and entering federal lands, should be erected at photo point 34.

Action Item 3: Remove yard wastes found along the most westerly entrance off of North Road and close trail using signage and/or obstacles.

Action Item 4: Remove mountain bike trail infrastructure throughout the reserve.

Action Item 5: Request that references to the Nature Reserve be removed from local tourist literature to reduce traffic and associated damage to the trail system and natural integrity of the Nature Reserve.

Short-term Management Strategies

Short-term management strategies are intended to be initiated within the first two years; or as resources permit.

Action Item 6: Close all trails as discussed in Section 5.1 through use of barriers or signage.

Action Item 7: Examine possible routes to relocate the main loop trail away from Stoney Creek at photo point 18 with respect to adjacent wetland.

Action Item 8: Construct stream crossings over Stoney Creek at photo points 3 and 13.

Action Item 9: Examine potential barrier methods to exclude use of mountain bikes and motorized vehicles within reserve boundaries if this issue persists despite signage.

Action Item 10: Begin a removal strategy for invasive plants, such as English holly, Scotch broom and English ivy.

Action Item 11: Conduct a summer inventory of the flora of the Elder Cedar (S'ul-hween X'pey) Nature Reserve to identify potential additional rare or threatened species and invasive species, the results of this inventory may determine additional actions items within this plan.

Medium-term Management Strategies

Medium-term management strategies are those that should be initiated within three to five years; or as resources permit.

Action Item 12: Erect signage along the trail to indicate the vulnerability of veteran trees to damage from recreational traffic or/and explore options to block access to trees to protect them from further damage.

Action Item 13: Explore options to obtain funding for the construction of a boardwalk in areas where the trail system passes over seasonally or persistently wet areas. This includes that area found between photo points 14 and 16 and 34 and 36.

Long-term Management Strategies

Long-term management strategies are those that should be initiated within five to ten years, or as resources permit.

Action Item 14: Seek a removal strategy for reed canarygrass once methods for its removal are better understood.

6.0 Conclusion

The Elder Cedar (S'ul-hween X'pey) Nature Reserve was acquired by the Islands Trust Fund with a long term vision for its natural conservation value and significance to the Gabriola Island community. In time, this property will protect in perpetuity several rare and endangered plant communities.

The Elder Cedar (S'ul-hween X'pey) Nature Reserve has long been the focus of conservation initiatives by the Gabriola Conservancy, Islands Trust, and local residents. The acquisition of this property contributes substantially to the protection and conservation of this resource and the natural heritage of Gabriola Island.

7.0 References

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8.0 Appendices

Appendix A. Environmental Inventory Data

A basic inventory of the reserve was conducted on November 13th and 14th, 2006. The inventory was completed following the Islands Trust Fund Natural Area Protection Tax Exemption Program (NAPTEP) guideline and the provincial Biogeoclimatic Ecosystem Classification (BEC) system.

Previous studies used for the inventory included a 1996 report entitled *Reconnaissance Level Ecological Inventory of Proposed Woodlot #1632: Gabriola Island* by Triton Environmental Consultants and Huock Resource Consultants. In particular, the Terrestrial Ecosystem Map that accompanied the report was extensively used to assist with vegetation type boundaries and for soil and terrain descriptions.

Methodology

A basic inventory of indicator species from each vegetation type was completed. Data were collected from 40m² plots for shrubs, herbs and mosses, while tree data were collected from visual approximations of one hectare plots (where possible). The species lists are not considered to be comprehensive.

Note that the vegetation species and percent cover indicated in the following descriptions are a reflection of the time of year in which the survey was completed. Herbaceous vegetation was identified, but percent cover was generally not estimated as it was not considered to be accurate. As well, crown closure was estimated based on the expected full summer canopy cover.

Classification of the vegetation types to the BEC site series level was completed. Classification was based on slope position, aspect and indicator vegetation. Soil moisture and nutrient regimes were estimated from the previously described features as soil pits were not dug.

Floral Species Lists

The following tables contain floral species identified in each vegetation type.

Table 7. Species List for Vegetation Type 1

Common Name	Scientific Name	Layer	% Cover	Height	DBH
Trees (A1 – Veterans, A2 – Main Canopy, A3 – Sub-canopy)					
Douglas-fir	<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	A1	5	30m	1.5m+
arbutus	<i>Arbutus menziesii</i>	A2	45	17-20m	20-40cm
Douglas-fir	<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	A2	<1	17-20m	20-40cm
Douglas-fir	<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	A3	5	10-12m	10-20cm

grand fir	<i>Abies grandis</i>	A3	<1	10-12m	10-20cm
western hemlock	<i>Tsuga heterophylla</i>	A3	<1	10-12m	10-20cm
western red cedar	<i>Thuja plicata</i>	A3	<1	10-12m	10-20cm
Shrubs					
baldhip rose	<i>Rosa gymnocarpa</i>	B	<1		
Douglas-fir	<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	B	5		
dull Oregon grape	<i>Mahonia nervosa</i>	B	10		
red huckleberry	<i>Vaccinium parvifolium</i>	B	<1		
salal	<i>Gaultheria shallon</i>	B	50		
western hemlock	<i>Tsuga heterophylla</i>	B	<1		
western red cedar	<i>Thuja plicata</i>	B	<1		
Herbs					
grass species		C			
sword fern	<i>Polystichum munitum</i>	C	10		
Moss and Lichen					
electrified cat's-tail moss	<i>Rhytidiadelphus triquetrus</i>	D	10		
Oregon beaked moss	<i>Eurhynchium oreganum</i>	D	60		
stepmoss	<i>Hylocomium splendens</i>	D	15		
unidentified mosses		D	15		

Table 8. Species List for Vegetation Type 2

Common Name	Scientific Name	Layer	% Cover	Height	DBH
Trees (A1 – Veterans, A2 – Main Canopy, A3 – Sub-canopy)					
Douglas-fir	<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	A1	<1	25m	0.8-1m
western red cedar	<i>Thuja plicata</i>	A1	<1	25m	0.8-1m
Douglas-fir	<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	A2	35	20m+	30-40cm
western red cedar	<i>Thuja plicata</i>	A2	5	20m+	30-40cm
arbutus	<i>Arbutus menziesii</i>	A3	<1	10-15m	10-20cm
Douglas-fir	<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	A3	5	10-15m	10-20cm
western red cedar	<i>Thuja plicata</i>	A3	15	10-15m	10-20cm
Shrubs					
baldhip rose	<i>Rosa gymnocarpa</i>	B	<1		
dull Oregon grape	<i>Mahonia nervosa</i>	B	10		
grand fir	<i>Abies grandis</i>	B	<1		
hairy honeysuckle	<i>Lonicera hispidula</i>	B	<1		
oceanspray	<i>Holodiscus discolor</i>	B	2		
salal	<i>Gaultheria shallon</i>	B	60		
western red cedar	<i>Thuja plicata</i>	B	5		
Pacific dogwood	<i>Cornus nuttallii</i>	B	<1		

Herbs					
broad-leaved starflower	<i>Trientalis borealis</i>	C			
grass species		C			
sword fern	<i>Polystichum munitum</i>	C	10		
twinflower	<i>Linnaea borealis</i>	C	<1		
wall lettuce	<i>Lactuca muralis</i>	C			
Moss and Lichen					
electrified cat's-tail moss	<i>Rhytidiadelphus triquetrus</i>	D			
Oregon beaked moss	<i>Eurhynchium oreganum</i>	D			
stepmoss	<i>Hylocomium splendens</i>	D			
unidentified mosses		D			

Table 9. Species List for Vegetation Type 3

Common Name	Scientific Name	Layer	% Cover	Height	DBH
Trees (A1 – Veterans, A2 – Main Canopy, A3 – Sub-canopy)					
Douglas-fir	<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	A1	<1	30m+	1.5m+
western red cedar	<i>Thuja plicata</i>	A1	5	30m+	1.5m+
bigleaf maple	<i>Acer macrophyllum</i>	A2	10	20-25m	30-70cm
Douglas-fir	<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	A2	40	20-25m	30-70cm
red alder	<i>Alnus rubra</i>	A2	<1	20-25m	30-70cm
western red cedar	<i>Thuja plicata</i>	A2	15	20-25m	30-70cm
western red cedar	<i>Thuja plicata</i>	A3	15	15cm	10-15m
Shrubs					
dull Oregon grape	<i>Mahonia nervosa</i>	B	5		
red huckleberry	<i>Vaccinium parvifolium</i>	B	<1		
salal	<i>Gaultheria shallon</i>	B	5		
western red cedar	<i>Thuja plicata</i>	B	10		
Herbs					
sword fern	<i>Polystichum munitum</i>	C	50		
Moss and Lichen					
coastal leafy moss	<i>Plagiomnium insigne</i>	D	15		
Oregon beaked moss	<i>Eurhynchium oreganum</i>	D	30		
palm tree moss	<i>Leucolepis acanthoneuron</i>	D	10		
stepmoss	<i>Hylocomium splendens</i>	D	5		
unidentified mosses		D	20		
	<i>Kindbergia</i> sp.	D	5		

Table 10. Species List for Vegetation Type 4

Common Name	Scientific Name	Layer	% Cover	Height	DBH
Trees (A1 – Veterans, A2 – Main Canopy, A3 – Sub-canopy)					
bigleaf maple	<i>Acer macrophyllum</i>	A2	<1	20	40-60cm
red alder	<i>Alnus rubra</i>	A2	30	20	20-35cm

western red cedar	<i>Thuja plicata</i>	A2	5	25	40-60cm
Shrubs					
grand fir	<i>Abies grandis</i>	B	5		
Pacific crab apple	<i>Malus fusca</i>	B	1		
red alder	<i>Alnus rubra</i>	B	<1		
red huckleberry	<i>Vaccinium parvifolium</i>	B	<1		
salal	<i>Gaultheria shallon</i>	B	<1		
western red cedar	<i>Thuja plicata</i>	B	<1		
Herbs					
bracken fern	<i>Pteridium aquilinum</i>	C			
grass species		C			
lady fern	<i>Athyrium filix-femina</i>	C			
slough sedge	<i>Carex obnupta</i>	C	35		
sword fern	<i>Polystichum munitum</i>	C	30		
thistle species		C			
Moss and Lichen					
coastal leafy moss	<i>Plagiomnium insigne</i>	D	5		
electrified cat's-tail moss	<i>Rhytidiadelphus triquetrus</i>	D	<1		
Oregon beaked moss	<i>Eurhynchium oreganum</i>	D	5		
stepmoss	<i>Hylocomium splendens</i>	D	10		
unidentified mosses		D	20		
	<i>Kindbergia praelonga</i>	D	25		

Table 11. Species List for Vegetation Type 5

Common Name	Scientific Name	Layer	% Cover	Height	DBH
Trees (A1 – Veterans, A2 – Main Canopy, A3 – Sub-canopy)					
Douglas-fir	<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	A1	3	1.5-1.8m	30m+
western red cedar	<i>Thuja plicata</i>	A1	7	1.5-1.8m	30m+
Douglas-fir	<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	A2	5	60-80cm	20-25m
western red cedar	<i>Thuja plicata</i>	A2	10	60-80cm	20-25m
red alder	<i>Alnus rubra</i>	A3	15	20-30cm	10-17m
western red cedar	<i>Thuja plicata</i>	A3	5	20-30cm	10-17m
Shrubs					
Douglas-fir	<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	B	5		
Pacific dogwood	<i>Cornus nuttallii</i>	B	<1		
red huckleberry	<i>Vaccinium parvifolium</i>	B	<1		
salal	<i>Gaultheria shallon</i>	B	45		
salmonberry	<i>Rubus spectabilis</i>	B	<1		
trailing black currant	<i>Ribes laxiflorum</i>	B	<1		
western red cedar	<i>Thuja plicata</i>	B	10		
Herbs					

bracken fern	<i>Pteridium aquilinum</i>	C			
common rush	<i>Juncus effusus</i>	C			
deer fern	<i>Blechnum spicant</i>	C	5		
grass species		C			
lady fern	<i>Athyrium filix-femina</i>	C			
slough sedge	<i>Carex obnupta</i>	C	5		
sweet-scented bedstraw	<i>Galium triflorum</i>	C			
sword fern	<i>Polystichum munitum</i>	C	35		
Moss and Lichen					
coastal leafy moss	<i>Plagiomnium insigne</i>	D	5		
electrified cat's-tail moss	<i>Rhytidiadelphus triquetrus</i>	D	5		
Oregon beaked moss	<i>Eurhynchium oreganum</i>	D	20		
palm tree moss	<i>Leucolepis acanthoneuron</i>	D	5		
stepmoss	<i>Hylocomium splendens</i>	D	10		
unidentified mosses		D	5		

Due to the variety of ecological conditions found within Vegetation Type 6, two vegetation lists have been provided. Table 12 contains common species of the drier areas while Table 13 represents wetlands and seepage sites.

Table 12. Species List for Vegetation Type 6

Common Name	Scientific Name	Layer	% Cover	Height	DBH
Trees (A1 – Veterans, A2 – Main Canopy, A3 – Sub-canopy)					
Douglas-fir	<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	A1	<1	30m	100cm+
Douglas-fir	<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	A2	20	20-25m	40-50cm
western red cedar	<i>Thuja plicata</i>	A2	<1	20-25m	40-50cm
Douglas-fir	<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	A3	5	17-20m	20-30cm
grand fir	<i>Abies grandis</i>	A3	<1	17-20m	20-30cm
red alder	<i>Alnus rubra</i>	A3	20	17-20m	20-30cm
western red cedar	<i>Thuja plicata</i>	A3	20	17-20m	20-30cm
Shrubs					
baldhip rose	<i>Rosa gymnocarpa</i>	B	<1		
dull Oregon grape	<i>Mahonia nervosa</i>	B	5		
grand fir	<i>Abies grandis</i>	B	<1		
red alder	<i>Alnus rubra</i>	B	<1		
red huckleberry	<i>Vaccinium parvifolium</i>	B	<1		
salal	<i>Gaultheria shallon</i>	B	35		
western red cedar	<i>Thuja plicata</i>	B	<1		
Herbs					
bracken fern	<i>Pteridium aquilinum</i>	C			

sword fern	<i>Polystichum munitum</i>	C	50		
unidentified grass		C			
Moss and Lichen					
coastal leafy moss	<i>Plagiomnium insigne</i>	D	5		
Oregon beaked moss	<i>Eurhynchium oreganum</i>	D	25		
stepmoss	<i>Hylocomium splendens</i>	D	10		
unidentified mosses		D	20		

Table 13. Species List for Vegetation Type 6

Common Name	Scientific Name	Layer	% Cover	Height	DBH
Trees (A1 – Veterans, A2 – Main Canopy, A3 – Sub-canopy)					
western red cedar	<i>Thuja plicata</i>	A1	5	25m+	1m+
grand fir	<i>Abies grandis</i>	A2	5	20-25m	30-60cm
red alder	<i>Alnus rubra</i>	A2	5	20-25m	30-60cm
western red cedar	<i>Thuja plicata</i>	A2	30	20-25m	30-60cm
Shrubs					
red elderberry	<i>Sambucus racemosa ssp. pubens</i>	B	<1		
red huckleberry	<i>Vaccinium parvifolium</i>	B	<1		
salal	<i>Gaultheria shallon</i>	B	<1		
western red cedar	<i>Thuja plicata</i>	B	5		
Herbs					
common rush	<i>Juncus effusus</i>	C	10		
deer fern	<i>Blechnum spicant</i>	C	<1		
grass species		C	20		
lady fern	<i>Athyrium felix-femina</i>	C	<1		
slough sedge	<i>Carex obnupta</i>	C	10		
small-flowered bulrush	<i>Scirpus microcarpus</i>	C	10		
sword fern	<i>Polystichum munitum</i>	C	40		
three-way sedge	<i>Dulichium arundinaceum</i>	C	5		
Moss and Lichen					
Oregon beaked moss	<i>Eurhynchium oreganum</i>	D	10		
stepmoss	<i>Hylocomium splendens</i>	D	<1		
unidentified mosses		D	10		

A full inventory of the two open disturbed areas was not completed. A partial list of the important invasive species that were observed is given in the table below (Table 14).

Table 14. Species List for Vegetation Type 7

Common Name	Scientific Name	Layer	% Cover	Height	DBH
Shrubs (*invasive)					
Scotch broom*	<i>Cytisus scoparius</i>	B	20		
Herbs (*invasive)					
grass species		C			
reed canarygrass*	<i>Phalaris arundinacea</i>	C			

Islands Trust Fund Nature Reserve on Former UREP Property

Let us know what you think! Please fill out the following survey on the management of the former UREP property and return to Taara Environmental at the address below.

1.) Have you ever visited the former UREP property? YES NO

If YES, when did you first visit the property and how often do you visit the reserve?

2.) As a current or future visitor to the former UREP property, please list the activities that you enjoy pursuing there (eg. walking, wildlife viewing, mountain biking, research, other...)

3.) What are the special features most important to you in the former UREP property? Please list and indicate locations on the map provided

4.) Are there any activities that you think are incompatible with the protection of the natural features of an Islands Trust Fund Nature Reserve?

5.) Have you viewed wildlife or special plants while visiting the former UREP property? Please list below

6.) What are your suggestions for naming this new Nature Reserve? Why did you choose this name?

Please provide any additional comments you may have on this special place below

Please return completed surveys to Taara Environmental at 46054 King Avenue, Chilliwack, BC V2P 3B5, additional copies of this survey are available on our website at www.taara.ca/projects.html

Appendix C. Photos

Photographs were taken during the vegetation inventory on November 13th and 14th, 2006 with a Pentax *1stD 6.1 megapixel Digital SLR Camera (Table 15). Photos were not taken from marked locations and a tripod was not used. Focal length and all other variables were adjusted as required to document the given feature. Locations of all photos were mapped with a differential GPS with an accuracy of 1 to 5 metres.

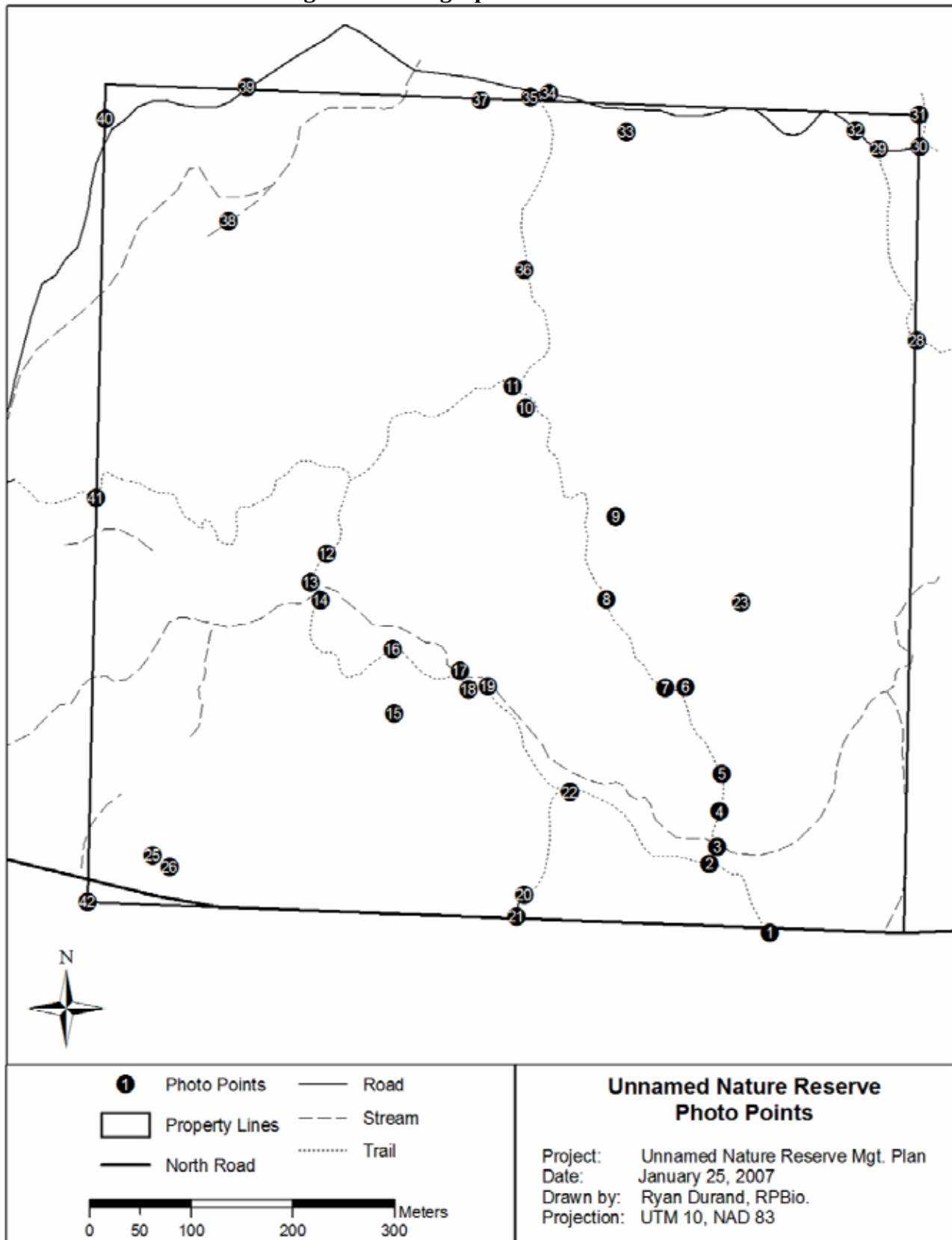
Where applicable, the general direction in which the photo was taken is given. Note that NA indicates that the direction of the photo was not recorded.

Table 15. List of Photos

Photo Point	File Name(s)	Direction	Description
1	1114-1118	NA	Main access point from North Road.
2	1119-1123	W, NE, SE, SE	Trail junction just south of Stoney Creek.
3	1124-1125	N, N	Trail crossing over Stoney Creek. No bridge.
4	1126-1130	SE, SE, SW, N, N	Trail junction and old road. Old road blocked by fallen trees – newer trail bypasses over creek.
5	1131-1134	NE, NE, S, NW	Trail junction to large veteran cedar.
6	1135	S	Large veteran cedar (2m DBH) adjacent to trail.
7	1136	N	Mountain bike ‘stunts’ on edge of trail.
8	1137	N	Mountain bike ‘stunts’ on edge of trail.
9	1138-1140	SW, SW, N	Sample plot. Examples of forest type.
10	1141-1144	W, NE, SE, SW	Trail braids around bike stunt. Photos of trail in both directions and adjacent forest.
11	1145-1147	SE, SW, NE	Trail junction.
12	1148-1151	SE, W, N, NE	Trail through mature older second growth fir and cedar. Photos of snags and bike stunts.
13	1152-1155	S, NE, SE, SW	Trail crosses creek. Small bike bridge. Photos of trail and looking up and downstream.
14	1156	S	Trail erosion and braiding in wet area.
15	1157-1160	E, S, W, N	Example of cedar slough sedge wetland.
16	1161-1162	W, W	Example of disturbed tree roots from trail use. Also impact to red-listed CDFmm14 wetland.
17	1163-1167	NW, N, E, S, NW	Various photos of trail, stream, wetlands and disturbance of stream bank from unknown cause.
18	1168-1169	E, E	Trail on edge of stream. High potential for erosion and impact to stream.
19	1170	E	Example of common wildlife tree with evidence of woodpecker use.
20	1171-1176	NA, NA, NE, NW, S, E	Open disturbed area adjacent to North Road. Photos of start of trail, invasive species such as broom and thistle, dumped yard trimmings, and general shots of open area.
21	1177-1179	W, N, E	Access point to open area and trails from North Road.

22	1180-1183	SW, N, E, SE	Sample plot. Example of forest type.
23	1184-1187	NE, SE, SW, NW	Example of rare CDFmm14 cedar slough sedge wetland.
24	1188-1191	N, E, SW, NW	Example of forest type at sample plot. Not in reserve or on photo location map.
25	1192-1193	NA	MOE groundwater monitoring well.
26	1194-1197	NA	Broom and other invasive weeds in open area adjacent to North Road.
27	1198-1201	NA	Start of trail at sign post. Not on reserve.
28	1202-1205	NW, N, SE, S	Access point where trail enters reserve.
29	1206-1209	S, NW, N, E	Trail junction with old road. Road still has vehicle use and damage to rocky outcrops.
30	1210-1213	N, E, S, W	Trail junction and blocked vehicle access point to adjacent gravel road.
31	1214-1216	W, N, S	IP and access point for small, undefined trail from adjacent residence.
32	1217-1219	NW, SE, NA	Damage to moss on rocky outcrop on well used old road.
33	1220-1223	E, S, W, N	Example of forest type at sample plot.
34	1224-1226	W, S, E	Trail junction with road.
35	1227	NA	Well used trail and signs of ATV use.
36	1228-1230	S, N, W	Wetland to north of reserve and photos of trail braiding where users avoid wet areas.
37	1231-1235	NE, E, S, W, NA	Rocky outcrop with undefined trail and evidence of minor ATV damage.
38	1236-1239	NW, N, NE, E	Example of forest type at sample plot.
39	1240-1243	SW, W, NE, E	Access point where old road crosses northern property line.
40	1244-1247	NW, N, E, S	Access point where old road crosses western property line.
41	1248-1251	S, SW, N, NE	Access point where faint user made trail crosses western property line.
42	1252-1253	NA, N	South west IP in detached area to the south of North Road.

Figure 6. Photograph Locations



Appendix D. Proposed Monitoring Route

The following section and map (Figure 7) describe key monitoring points on the reserve. If the recommendations presented in this management plan are enacted, then the monitoring route will require revisions. As well, general observations (such as trail condition) are required in addition to the 26 key sites. Key monitoring sites (list numbers correspond to numbered sites on Figure 7) are as follows:

1. Invasive species. Check open disturbed area to determine if invasive species are expanding or management options are working. If possible, check the wetland directly north to see if reed canarygrass is spreading.
2. Access point. Ensure signs are in place and that trail remains closed. Also check for evidence of recent dumping of yard waste, etc.
3. Invasive species. Check open disturbed area to determine if invasive species are expanding or management options are working.
4. Trail erosion. Determine if trail erosion on bank of stream is becoming worse and, if necessary, recommend appropriate remedial action.
5. Trail erosion. Determine if trail erosion in wet area (may not be wet all year) is becoming worse and, if necessary, recommend appropriate remedial action.
6. Creek Crossing. Check crossing to see if use is impacting creek bed, banks and adjacent riparian area. If a bridge has been built, ensure that it is not in need of maintenance.
7. Closed trail. Check if small foot path to the west is being used and that “trail closed” signs remain in place.
8. Wet area. If trail is in use, check seasonally wet area to determine if use is damaging it.
9. Access point. If trail remains in use, ensure appropriate signage is in place informing users that they are entering the reserve or exiting the reserve on to private property.
10. Access point. Ensure signs are in place. Check old road for signs of vehicle use.
11. Access point. Ensure signs are in place. Check old road for signs of vehicle use.
12. Sensitive rocky outcrop. Check moss covered rocky area to determine if ATV damage is continuing. Suggest remedial action if damage is observed.

13. Access point. Ensure signs are in place informing users that they are entering the reserve or exiting the reserve on to private property.
14. Access point. Ensure signs are in place informing users that they are entering the reserve or exiting the reserve on to private property.
15. Erosion. Check mossy areas on old road to determine if vehicle use is continuing and if additional areas are being damaged.
16. Access point. Ensure signs are in place informing users that they are entering the reserve or exiting the reserve on to private property. Ensure that boulders preventing vehicle access remain in place.
17. Access point. Ensure signs are in place informing users that they are entering the reserve or exiting the reserve on to private property.
18. Sensitive ecosystem. Determine if trail through wetland continues to cause erosion or is becoming more braided. If boardwalk has been built, determine if maintenance is required and that users are not impacting adjacent wetland areas. Conduct visual inspection to check for new invasive species such as reed canarygrass.
19. Trail erosion. Check if mountain bike features have been removed and if trail braiding continues.
20. Trail erosion. Check if mountain bike features have been removed.
21. Trail erosion. Check if mountain bike features have been removed. Determine if users are impacting large veteran cedar to the immediate east of the trail. Suggest remedial actions if impacts (such as new trail, root damage, etc.) are observed.
22. Creek Crossing. Check crossing to see if use is impacting creek bed, banks and adjacent riparian area. If a bridge has been built, ensure that it is not in need of maintenance.
23. Access point. Ensure signs are in place and parking is not damaging reserve. Check for evidence of any non-permitted use (camping, etc.) and other impacts such as garbage, etc.
24. Property corner. From point 24, proceed north to point 17 along flagged property line (flagging is not the exact property line). Check for any evidence of adjacent landowners encroaching or otherwise impacting the reserve.
25. Invasive species. Check status of English ivy in trees. Assess number of trees affected to determine if it is increasing.
26. Sensitive ecosystem. Check condition of Stoney Creek as it crosses the property line.

Figure 7. Proposed Monitoring Route

