

VEGETATION MANAGEMENT PLAN

3532 Stephenson Point Road
City of Nanaimo



To: Rob Turgeon
1870 Dufferin Crescent
Nanaimo BC V9S 1H1

CC: City of Nanaimo

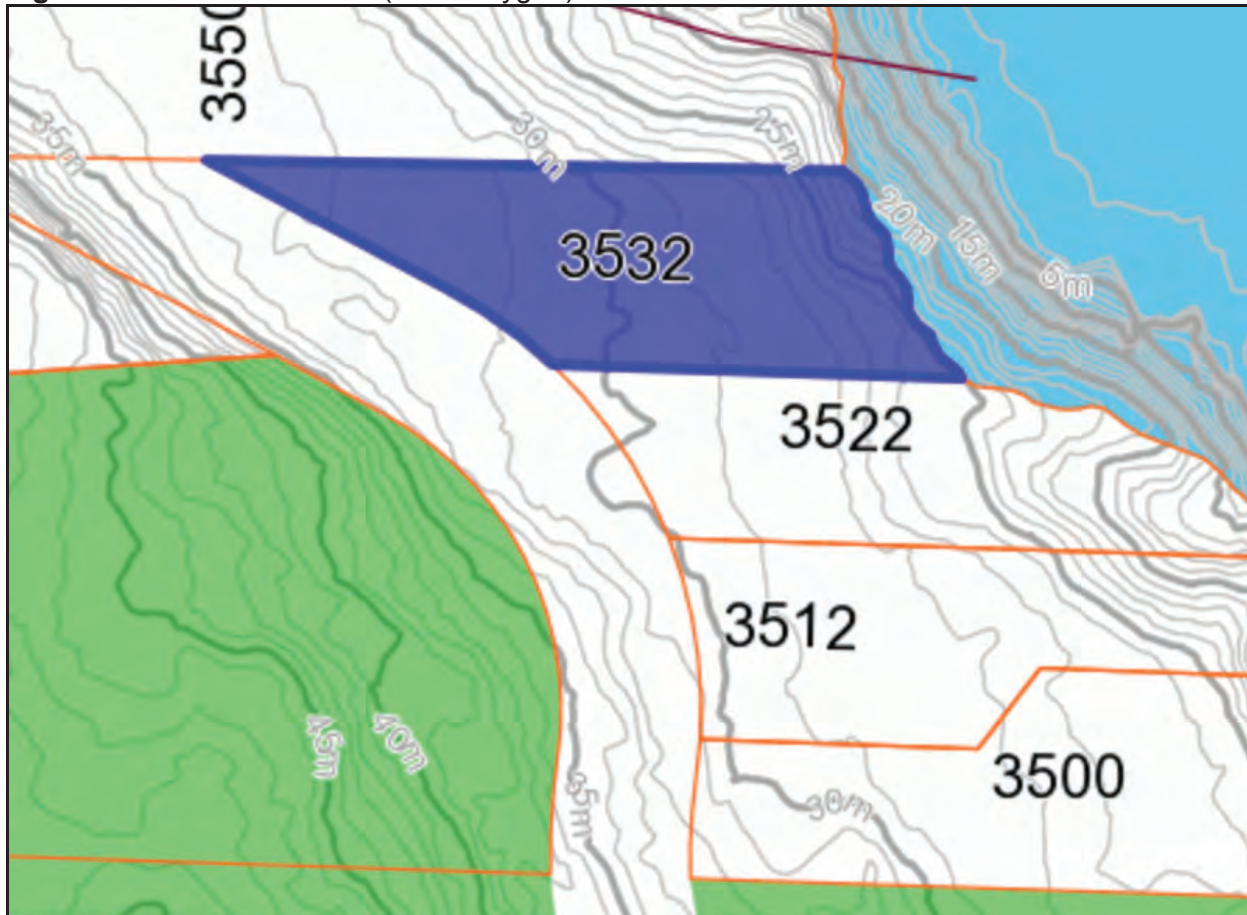
Date: 04 March 2020

1. Overview

This Vegetation Management Plan (the 'plan') was completed at the request of City of Nanaimo (the 'city') for 3532 Stephenson Point Road (**Figure 1**) per their letter dated 24 October 2019 (File DP001151). AquaTerra had previously completed and issued an Environmental Assessment (EA) for the site; however, the city specifically requested:

- 1) A Vegetation Management plan to address habitat compensation (Section 2); and
- 2) Invasive Species Management (Section 2.1).

Figure 1: Site Location Plan (Blue Polygon).



2. VEGETATION MANAGEMENT PLAN

The EA prepared by AquaTerra, and per the city letter, habitat compensation should be implemented to offset the 150 m² lost setback area. The city expressed concern that planting density would typically be 1 plant per 1 m², or denser; however, the provision of 6 trees and 17 shrubs only equated to 1 plant per 0.12 m². Therefore, based on the comments provided by the city, and in accordance with the BC Landscape Standards per the BC Society of Landscape Architects (BCSLA), AquaTerra has supplemented the habitat compensation design and invasive species management provisions (herein, referred to as the 'Vegetation Management Plan'), increasing planting density to 1 plant per 1 m².

TREES

- 10 Western Redcedar (*Thuja plicata*) (2 gallon pots)
- 10 Bigleaf Maple (*Acer macrophyllum*) (2 gallon pots)

SHRUBS AND HERBACEOUS

- 40 Salal (*Gaultheria shallon*) (2 gallon pots)
- 40 Dull Oregon-grape (*Mahonia nervosa*) (2 gallon pots)
- 20 Salmonberry (*Rubus spectabilis*) (1 gallon pots)
- 30 Swordfern (*Polystichum munitum*) (1 gallon pots)

TOTAL NUMBER OF PLANTS: 150.

A detailed, prescriptive planting plan is provided per Attachment I.

The cost of these trees/shrubs is approximately \$10.00 (1 gallon) and \$20.00 (2-gallon) + delivery (\$200.00). Estimated cost for 1 cubic yard of top-soil is \$100.00 (delivered). Estimated time for planting is approximately 2 days + time for invasive species management (1 day).

A general best management practice is to monitor the newly planted trees/shrubs and to maintain regular watering practices as well as invasive species management on a semi-annual basis for 3 years, until such time that plants are established. An additional measure to improve plant health and survival is to include some new top-soil blend with bone meal to provide nutrients for rooting establishment.

Landscaping of the area within the area is encouraged per the latest version of the BCSLA. A summary of applicable measures per the standards are provided below:

1. Import top-soil, if required, to achieve a minimum rooting depth of 0.6 m for trees and 0.3 m for shrubs
2. All tree/shrub species should be of guaranteed nursery stock.
3. Trees are to comprise at least 15% of the total planting prescription.
4. The botanical name should be used when ordering stock to ensure that the desired native species is being purchased. Each specimen should be tagged with the botanical name and the tag should be left attached after planting.
5. Stock planted during the fall (Sept. - Oct.) and spring (March - April) have the greatest likelihood of surviving. Regular watering may be required until the plants are established.
6. Additional advice on proper planting procedures should be obtained from the nursery supplying the stock.
7. Planting on a given area being enhanced must be successful to an 80% take. If more than 20% die over one year, replanting is required.
8. A minimum of 50% of trees and shrubs planted should be fruit-bearing species.

2.1 Invasive Species Management

Invasive vegetation is present throughout the site sporadically, including adjacent sites, being most prevalent in the shrub layer and ravine. Invasive vegetation should be removed from the vegetation management (habitat compensation) area, per the recommended removal methods prescribed in the following sections, and maintained twice a year for 3 years, until planted vegetation becomes well established.

2.1.1 Himalayan Blackberry

Himalayan Blackberry was initially brought over from Europe as a result of their large, delicious berries. These species results in dense thickets that often outcompete native vegetation and reduce biological diversity. In addition to reducing the plant diversity, these species also serve to limit utilization by aquatic and terrestrial wildlife, serving as a barrier to movement. Certain bird species, such as Dark-eyed Junco (*Junco hyemalis*), Black-capped Chickadee (*Poecile atricapillus*) and Yellow-breasted Chat (*Icteria virens*; provincially red-listed and federally

'threatened'), do utilize invasive blackberry species, as they provide some forage opportunities and protection; however, the impacts relating to barrier movement and loss of habitat diversity outweigh the perceived benefits.

Dispersal Capabilities: Invasive blackberry species spread by seed and vegetatively by rooting at the stem tips as well as sprouting from root buds. Birds and omnivorous mammals, such as raccoons, bears, and coyotes can consume berries and disperse seeds.



Preferred Control Method: The primary management goal is to control and manage the spread of Himalayan Blackberry into adjoining, intact habitats within the Musqueam IR#3 lands. Maintenance to prevent additional encroachment into Musqueam IR#3 lands includes persistent cultivation (tillage), fine mulching and hand removal (including roots when possible) to limit spread. Due to the fact that mechanical control can stimulate strong regrowth, removal efforts should be followed up with regular hand digging and trimming to manage the spread.

Removal Timing: Removal can proceed at any time of year, but is anticipated to be more effective during the flowering and early fruiting periods. Removal should not occur when fruits are at or nearing maturity, as it may increase the potential of spread during removal and disposal efforts. Removal and follow-up maintenance should occur a minimum of 2–3 times per year, for 2–3 years following initial removal.

Disposal: If plants are cut, all plant material must be collected in bags or tarps and incinerated or bagged and deeply buried at a landfill. Care should be taken to ensure that plant parts are not distributed during transport.

2.1.2 *Spurge Laurel*

Spurge Laurel is an evergreen shrub that was imported from Britain for ornamental use in North American gardens. Spurge Laurel is similar in appearance to Pacific Rhododendron, however it grows rapidly and outcompetes native species. In addition, the bark, berries and sap are poisonous to people and it is classified as a poisonous plant with the Canadian poisonous plant information system (Invasive Species of BC, 2014). In contrast to most invasive species, Spurge Laurel is able to establish without any ground disturbance. It is commonly found along roadsides and in moist forested lowland areas. Its rapid growth and adaptability to varying light condition allows it to quickly colonize new areas where it alters the soil chemistry displacing native species.



Dispersal Capabilities: Birds and rodents spread the seeds contained within the berries.

Preferred Control Method: Due to its toxic nature, gloves should be worn when removing Spurge Laurel. Small plants may be pulled by hand while large plants may require digging for root removal. After removal the area should be reassess bi-annually to monitor for regrowth.

2.1.3 *English Ivy*

English Ivy is a perennial evergreen vine native to Europe and Asia that is widely cultivated in North America. It is often planted for groundcover and frequently invades nearby natural and urban areas. English Ivy grows rapidly and is able to grow year-round in a wide variety of light conditions, but does best in shaded areas. It quickly outcompetes native plants and forms a dense monoculture that prevents natural seedling succession and can damage or kill trees and shrubs.

Dispersal Capabilities: English Ivy spreads vigorously by vegetative growth and by production of small black seed containing fruits that are consumed and spread by birds (Swearingen et al. 2010).



Preferred Control Method: English Ivy can be pulled and cut by hand and then left to dry. Mowing is also a viable control option, as is covering the affected areas with thick poly and/or tarps. When climbing trees it should be removed from breast height to the ground and then treated with a herbicide on the cut portions. Ivy that is above breast height in a tree should not be pulled down as it may dislodge large tree branches. After English Ivy removal, native shrubs should be replanted and the area should be reassessed to monitor for re-growth. Additional removal efforts will likely be required as re-growth from roots is common.

2.1.4 English Holly

English Holly is native to western and southern Europe, northwest Africa and southwest Asia. It was originally imported for ornamental use in North American gardens and is widely used for decorations during the Christmas season. English Holly is very adaptable and rapidly grows in well-drained soils in the shade or sun to heights of up to 10 m tall (Invasive Species Council of BC, 2014). Its broad evergreen leaves, rapid growth and overall size, shade out other native plants allowing it to form dense thickets over time. In addition, the roots of English Holly out-compete native species for nutrients and water (Klinkenberg, 2014)



Dispersal Capabilities: The bright red berries of English Holly are attractive to birds and widely dispersed.

Preferred Control Method: Small English Holly shrubs can be pulled when the ground is moist. Large trees should be cut at the base of the trunk and herbicide may be applied. Management areas should be re-assessed annual to monitor for re-growth (Sea to Sky Invasive Species Council, 2009).

3. CLOSURE

We trust this provides the necessary information regarding RAR compliance. Should you have any questions, please feel free to contact the undersigned.

Respectfully submitted,

 Digitally signed by Chris Lee
DN: cn=Chris Lee, o=AquaTerra
Environmental Ltd., ou,
email=chris@aquaterra.ca, c=CA
Date: 2020.03.14 11:00:50 -07'00'

Chris Lee, M.Sc., R.P. Bio., QEP, BC-CESCL
Principal, AquaTerra Environmental Ltd.

Attachment(s):

Attachment I – Detailed Restoration Planting Plan

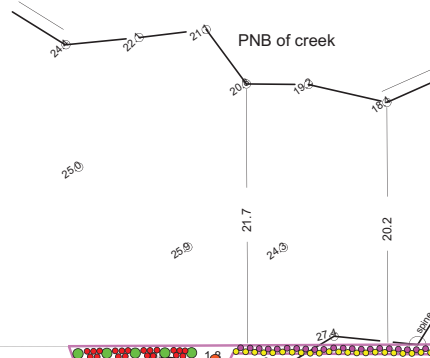
SKETCH PLAN OF LOT 1, PLAN 3902, DISTRICT LOT 29, WELLINGTON DISTRICT.

SHOWING ELEVATIONS AND TOPOGRAPHIC INFORMATION THEREON

SCALE = 1:500

All distances are in metres.

Elevation datum, in metres, is Geodetic.



PLANTING LEGEND

- Western Redcedar (*Thuja plicata*) n=10
- Big-leaf Maple (*Acer macrophyllum*) n=10
- Salal (*Gaultheria shallon*) n=40
- Dull Oregon-grape (*Mahonia nervosa*) n=40
- Swordfern (*Polystichum munitum*) n=30

STRAIT OF GEORGIA

STEPHENSON POINT ROAD

LOT 1 PLAN 3902

PROPOSED HOUSE

EASEMENT PLAN EPP79400

shed



File: WL-29-GEN

BIRD'S EYE VIEW

SCALE: 1/16" = 1'-0"

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R. Turgeon	
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