VEGETATION PLAN

21780/21832/21840 South Westminster Shore & 10880 Dyke Road, Surrey

PREPARED FOR: Goodrich Group of Companies

PREPARED BY:

PACIFIC LAND GROUP
Land Use, Development & Environmental Strategists

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List of Acronyms

BMPs	Best Management Practices
COSMOS	City of Surrey Mapping Online System
CWHxm	Coastal Western Hemlock Central Very Dry Maritime
EM	Environmental Monitor
EVL	Eastern Vacant Lot
ISCBC	Invasive Species Council of British Columbia
ISCMV	Invasive Species Council of Metro Vancouver
OCP	Official Community Plan
PFA	Perimeter and Foreshore Area
PLG	Pacific Land Group
QEP	Qualified Environmental Professional

1.0 INTRODUCTION

Pacific Land Group (PLG) was retained by Goodrich Group of Companies (the Client) to prepare a Vegetation Plan (VP) for the proposed paving and installation of a rail spur within the properties located at 21780/21832/21480 South Westminster Shore & 10880 Dyke Road, Surrey, BC (Subject Properties) and the adjacent foreshore areas to the northwest of 21780/21832/21840 South Westminster Shore (shown in the blue outline, in Figure 1 below).

This VP has been prepared to document the current vegetation communities on the Site and provide an effective maintenance program, where applicable, including a plan to control and prevent the spread of invasive species known to exist on-site.

It is understood that Japanese knotweed (*Fallopia japonica)* was previously documented within the Site and as such, a strategy to control, mitigate and prevent future growth of the species has also been requested.

Figure 1. Area outlined in blue (i.e., Site) is proposed to be leased from the Port of Vancouver.

This VP presents an acceptable Site-specific (and location specific) treatment plan/methodology for the removal and management of Japanese knotweed (*Fallopia japonica*) and other invasive species [i.e., Himalayan blackberry (*Rubus armeniacus*) and Scotch broom (*Cytisus scoparius*)] identified on-Site. Additionally, this plan quantifies available native vegetation on-Site and provides mitigation measures to protect and preserve vegetation, where possible. The area of assessment within the Site includes two (2) areas of interest [i.e., the Perimeter and Foreshore Areas (PFA) and the Eastern Vacant Lot (EVL); Figure 2, below].

Figure 2. COSMOS aerial of the Site (dashed blue line), showing the area of assessment (green hatched areas) evaluated during PLG's Site visits.

Background research included a review of invasive species management material produced by the Invasive Species Council of British Columbia (ISCBC), Invasive Species Council of Metro Vancouver (ISCMV), and direct communication with Vancouver Fraser Port Authority (VFPA) Project Staff. A preliminary Site visit was completed by PLG's Qualified Environmental Professionals (QEPs) on April 2, 2019 to investigate existing vegetation conditions and identify the estimated locations of invasive species within the Site. A follow-up visit was completed by PLG's QEPs on April 29, 2019 to confirm and map the approximate location(s) and extent of the invasive species (specifically Japanese knotweed) observed within the Site during the preliminary Site visit, and identify any additional locations of invasive species.

1.1 Project Location / Site Description

The Site is approximately 2.31 acres (0.94 hectares) in size, is designated "Industrial" in the City of Surrey's Official Community Plan (OCP), and is currently zoned "Light Impact Industrial Zone" (IL-1). The Site is located adjacent to industrial developments to the northeast and southwest, industrial developments on the other side of the Canadian National Railway to the southeast, and the Fraser River to the northwest.

1.2 Project Description

The proposed Project will consist of paving and rail spur installation within the properties located at 21780/21832/21840 South Westminster Shore & 10880 Dyke Road, Surrey, BC (Subject Properties/Site). It is understood that the Project components will consist of the following:

- Paving the existing unpaved areas within the Site for increased lumber storage;

- Removal of some vegetation (clearing and grubbing) to accommodate proposed developments (i.e., paving and rail spur installation);

- Installation of a rail spur to aid with transloading lumber into transportation vehicles for export; and

- Equipment access through existing paved areas where possible to limit disturbance to other areas around the Site.

1.3 Scope of Assessment

Invasive species have the potential to cause negative impacts to ecosystem health, at-risk species and ecological communities. The scope of work for this Project includes the following:

- Conduct Site visit(s) to identify the extent of invasive plant species (e.g., Japanese knotweed, Himalayan blackberry, Scotch broom), in areas of known presence within the Site. The Site visits will also assess the remainder of the Site for other areas of infestation.

- Prepare a VP, which contains Site visit findings, potential environmental impacts, and mitigative strategies, with reference to municipally and provincially acceptable Best Management Practices (BMPs) for control of identified invasive species within the Site.

The scope of this VP includes an assessment of the Site, in its entirety, addresses existing invasive plant populations within the Site, concentrated within two areas: PFA and EVL (refer to Figure 2, above and attached).

1.4 Potential Environmental Impacts

The potential temporary and permanent impacts to both wildlife and habitats due to the proposed Project are identified below:

- The removal of non-native, invasive species and the proposed work (i.e., paving) may reduce the likelihood of invasive species regrowth within the Site and reduce (although temporarily), potential habitat for ground nesting birds within the EVL;

- The removal of non-native, invasive species could promote the spread and growth of native species temporarily (until paving occurs, specifically in the EVL); and

- Tree clearing may reduce the availability of above-ground nesting sites.

Although temporary, the potential environmental impacts identified above are not anticipated to negatively affect on-Site habitat and wildlife, provided the BMPs and

mitigation measures outlined in the Project's Construction Environmental Management Plan (CEMP) for this Site are followed.

2.0 ENVIRONMENTAL SETTING

The following sections summarize the environmental characteristics and features of the Site. The objectives are to identify potential sensitivities that might require further investigation or that may be affected by Project works and undertakings.

2.1 Topography

The Fraser River borders the northwest border of the Site, with a gradual northwest sloping terrain down to the water's edge. The terrain within the Site is relatively flat, containing City of Surrey Mapping Online System (COSMOS) mapped Flood Prone Areas across the entire Site. Elevation limits range from sea level to approximately 150 metres in the Fraser Valley (Green & Klinka, 1994).

2.2 Soils and Geology

Topography in the general vicinity of the Site slopes towards the northwest with an average slope gradient of about 5 degrees. The Site lies within the Coastal Western Hemlock Central Very Dry Maritime (CWHxm) subzone. The soils of zonal ecosystems are most often Humo-Ferric Podzols, which lack an eluvial horizon because the heavy leaching is offset by rapid addition of organic colloids and weathering of iron and aluminum. The soil condition within the Site is classified as an unclassified urban soil, undisturbed by agriculture (iMapBC, 2019). Soil composition varies from nutrient very-poor to medium soils that are moderately dry. Water-shedding sites occur on rapidly drained, coarse-skeletal soil materials on upper slopes or valley bottoms in the CWHxm subzone (Pojar, 1999).

2.3 Climate

The climate on the coast is moderated by proximity to the Pacific Ocean, resulting in generally warm and temperate weather. Seasonal conditions vary with warm, dry summers and moist, mild winters with relatively little snow fall (Green & Klinka, 1994). Recent data for this area, indicates the annual precipitation from January 2018 to January 2019 was a total of 1,484 mm (Environment Canada). Precipitation is highest during the fall and winter months (e.g., November 2018 – 203 mm, December 2018 – 254 mm, January -249 mm) followed by early spring (February, March, April). The monthly rainfall average for 2018 was 124 mm.

2.4 Biogeoclimatic Zone and Vegetation

The Site lies within the CWHxm subzone which extends up the south side of the Fraser River as far as Chilliwack, and along the Sunshine Coast as far as Desolation Sound. Forests within the zonal sites of the CWHxm are dominated by native coniferous tree species, including Douglas-fir (*Pseudotsuga menziesii*), Western hemlock (*Tsuga heterophylla*) and Western red

cedar (*Thuja plicata*). The understory vegetation is typically dominated by salal (*Gaultheria shallon*), red huckleberry *(Vaccinium parvifolium*), and dull Oregon-grape *(Mahonia nervosa*). Less common vegetation species found within the CWHxm subzone are sword fern (*Polystichum munitum*), bracken fern (*Pteridium aquilinum*), and vanilla leaf *(Achlys triphylla*). Oregon beaked moss (*Kindbergia oregana*), step moss (*Hylocomium splendens*), lanky moss (*Rhytidiadelphus loreus*), and flat moss (*Plagiothecium undulatum*) dominate the well-developed moss layer in the understory (Pojar, 1991).

2.5 Environmentally Sensitive Areas

The Site is currently located within a COSMOS mapped Sensitive Ecosystem Development Permit (DP3) Area, specifically within a 50 metre Streamside Area buffer. Streamside Areas represent those areas next to and setback from a stream that link aquatic and terrestrial ecosystems, as well as those areas that exert influence on a stream whether for food or habitat reasons. Although the site is located within a DP3 area, Surrey's DP3 requirements are not expected to apply on the Subject Property as the property is under the VFPA authority.

2.6 Land Use

The Port of Vancouver owns these lands and the surrounding properties are existing industrial facilities with paved roads connecting infrastructure. The Fraser River runs adjacent to the Site, along its northwest border and provides a hub for import and export of materials.

3.0 SURVEY METHODOLOGY

Vegetation assessments were completed over on foot over two (2) days (April 2 and April 25, 2019) by PLG's QEPs. Predominant and unique biological features within and directly adjacent to the Site were noted and recorded during the Site visits. The survey limit/assessment area was delineated by the Fraser River foreshore to the northwest and an existing rail track to the southeast. PLG's QEPs documented several deciduous tree species within the Foreshore Area of the Fraser River and dispersed along the entire perimeter of the Site, as well as non-native and noxious weeds located in the EVL.

The assessments involved identification and documentation of tree and vegetation cover, dominant plant species, and rare or introduced plants observed within the Site. Vegetation was described using Plants of the Pacific Northwest (Pojar and MacKinnon, 2004) and biogeoclimatic subzone information available online (BC BECweb, 2012). Wildlife habitat requirements were cross-referenced with available habitat on-Site to evaluate potential wildlife use within and adjacent to the Project areas.

4.0 SURVEY RESULTS

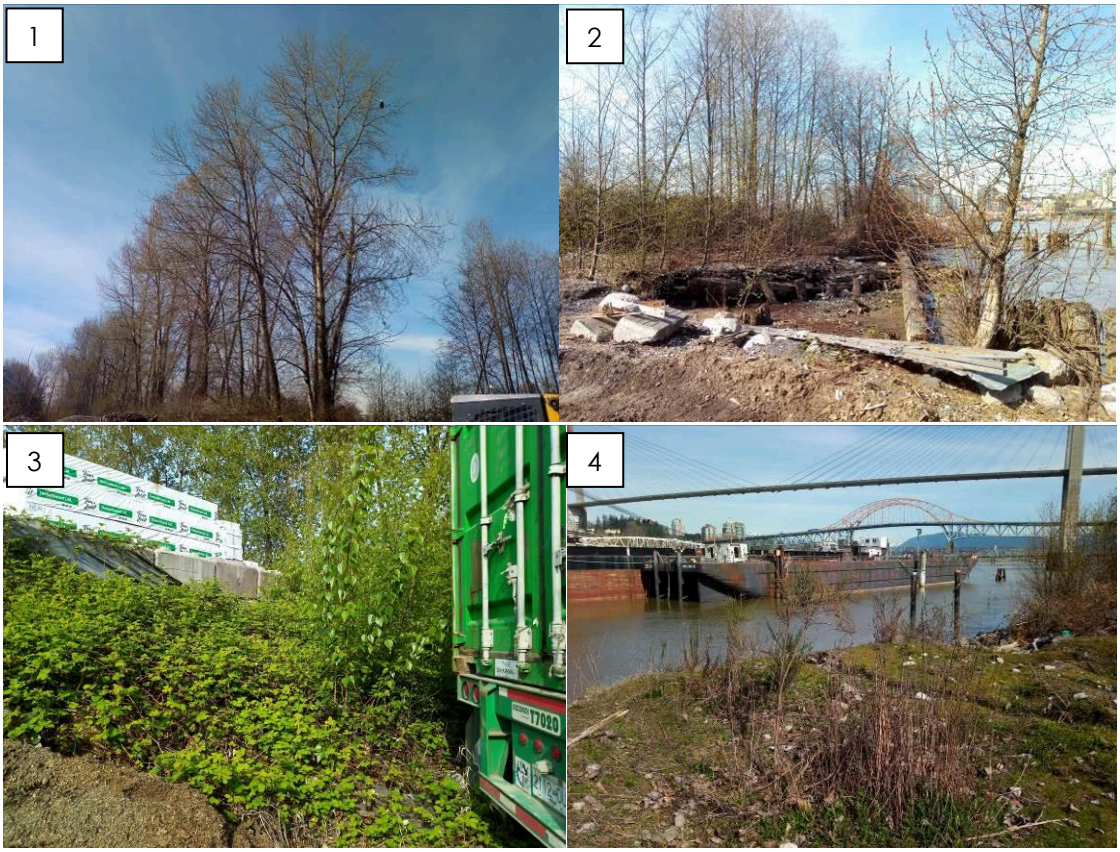
PLG's QEPs, completed two (2) Site visits on April 2 & 25, 2019 to document the current vegetation species on-Site, assess relative abundance and quantify species (both invasive

and native), where possible. Observed wildlife were also documented during the Site assessments.

Vegetation within the Site varied in composition (e.g., trees and grass) and was observed mostly around the approximate western half perimeter boundaries (i.e., PFA), and within the approximate eastern half of the Site (i.e., EVL), represented by Figure 2, above. Details with respect to each of the two (2) assessment areas (i.e., PFA and EVL) have been further described below. Although the overall Site is relatively void of vegetation, it is anticipated that perimeter tree removal may be required to accommodate proposed development within the Site.

4.1 Perimeter and Foreshore Areas (PFA)

Within the PFA, native tree species such as willow (*Salix* sp.), red alder (*Alnus rubra*) and black cottonwood (*Populus trichocarpa*) were observed, as well as native shrub and grass species such as the red-osier dogwood (*Cornus sericea*) and tidal grass (*Phyllospadix scouleri*; Photographs 1 and 2). Non-native, invasive species observed within the PFA include Himalayan blackberry (*Rubus armeniacus*), common tansy (*Tanacetum vulgare*), and Scotch broom (*Cytisus scoparius*; Photographs 3 and 4).



Photographs 1-4. Native and non-native, invasive vegetation observed within the PFA of the Site during the assessments.

4.2 Eastern Vacant Lot (EVL)

The EVL was mainly comprised of disturbed ground with non-native, invasive vegetation. Native vegetation (Photographs 5 and 6) included grasses (*Poaceae*), horsetail (*Equisetum*), white clover (*Trifolium repens*), and red alder (*Alnus rubra*). Non-native invasive species (Photographs 7 and 8) were also present, including Scotch broom (*Cytisus scoparius*), common tansy (*Tanacetum vulgare*), Himalayan blackberry (*Rubus armeniacus*), and Japanese knotweed (*Fallopia japonica*).

Photographs 5-8. Native and non-native, invasive vegetation observed within the EVL of the Site during the assessments.

4.3 Summary of Plant Species Present

The following tables provide a summary of the vegetation species observed within the Site assessment areas (i.e., PFA and EVL) during the two (2) Site visits. The PFA was mainly comprised of native tree and shrub species (Table 1, below). Within the EVL, mostly non-native invasive shrub species were present (Table 2, below).

Table 1. PFA - Plant species observed during vegetation assessments.

Common Name	Scientific Name
Black cottonwood	*Populus trichocarpa*
Common tansy	*Tanacetum vulgare*
Himalayan blackberry	*Rubus armeniacus*
Red alder	*Alnus rubra*
Red osier dogwood	*Cornus sericea*
Scotch broom	*Cytisus scoparius*
Tidal grass	*Phyllospadix scouleri*
Willow	*Salix sp.*

Invasive Species

Table 2. EVL - Plant species observed during vegetation assessments.

Common Name	Scientific Name
Black medic	*Medicago lupulina*
Common tansy	*Tanacetum vulgare*
Cinquefoil	*Rosaceae sp.*
Dandelion	*Taraxacum officinale*
English ivy	*Hedera helix*
Field pennycress	*Thlaspi arvense*
Himalayan blackberry	*Rubus armeniacus*
Japanese knotweed	*Reynoutria japonica*
Leafy spurge	*Euphorbia esula*
Rabbit's ear	*Ruttya fruticosa*
Red-osier dogwood	*Cornus sericea*
Rush skeletonweed	*Chondrilla juncea*
Scotch broom	*Cytisus scoparius*
Thistle	*Cirsium*
White clover	*Trifolium repens*
White sweet-clover	*Melilotus albus*

Invasive Species

5.0 VEGETATION MANAGEMENT PLAN STRATEGY

Invasive plant species are typically fast growing and tenaciously colonize disturbed sites. Management of invasive species may include chemical, manual, or mechanical controls, or a combination of these methods. Management strategies and treatment methods for individual species (i.e., Japanese knotweed) and other invasive species (e.g., Himalayan blackberry and Scotch broom) identified on-Site are included in the sections below. Where applicable, appropriate methods for off-Site transportation and disposal are included. It is understood that only herbicides approved by the City of Surrey and the Invasive Species Council of Metro Vancouver ISCMV) will be considered for use on-Site. As part of the Vegetation Management Plan strategy for this Site, a maintenance and monitoring

schedule is proposed for the immediate management of the non-native, invasive species identified on-Site during the assessments.

5.1 Vegetation Maintenance and Monitoring Schedule

Target Location	*Treatment Program/Monitoring*	*Estimated Timeline*
PFA	Mechanical Removal / Manual Control of non-native species (e.g., Himalayan blackberry and Scotch Broom)	Upon approval of the VP by the VFPA
	Maintenance of existing trees along the foreshore area	Until construction completion
	Monitoring	Until construction completion
EVL	Chemical Treatment of Japanese Knotweed Growth Areas	PHASE 1 - Spring (i.e., immediately upon approval of the VP by the VFPA) + PHASE 2 - Fall (i.e., secondary herbicide treatment)
	Manual / Mechanical Control (i.e., trimming dead shoots of Japanese knotweed) + manual removal of other non-native vegetation within the EVL	Upon approval of the VP by the VFPA
	Monitoring	Until construction completion + following completion of all control/removal treatments

The following two (2) sections provide specific methodology and BMPs for treatment, removal and ongoing maintenance of the non-native, invasive species identified within the Site assessment areas (i.e., PFA and EVL). These methods are to be implemented until eradication of the invasive species (e.g., Japanese Knotweed, Himalayan blackberry, Scotch broom) can be confirmed following 1-2 years of monitoring after development completion, to ensure no regrowth has occurred within the treatment/management areas (e.g., growth through the future EVL pavement, growth outside of the PFA).

5.2 PFA Vegetation Management

5.2.1 PFA Native Vegetation Retention

A grassed bio-swale is proposed for along a portion of the foreshore area within the PFA (i.e., area adjacent to the EVL). The bioswale is proposed for stormwater management purposes, and has been included on the civil design plans prepared by Centras Engineering Ltd. for the Site (Figure 3, below). Existing large trees available north of the EVL and north of the proposed bio-swale, will be retained (Figure 4, below).

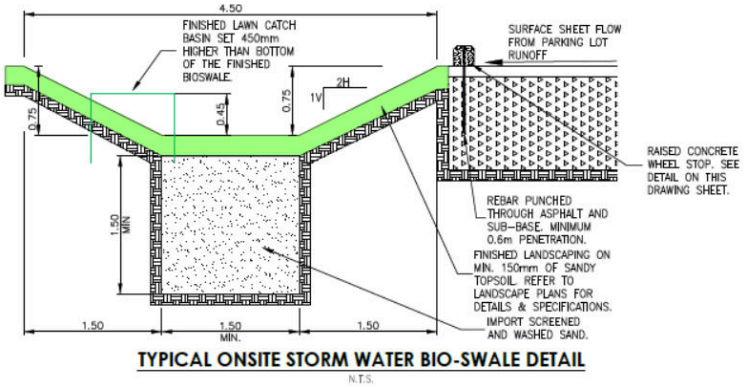


Figure 3. Engineered bioswale and vegetation buffer proposed along the northern edge of the EVL

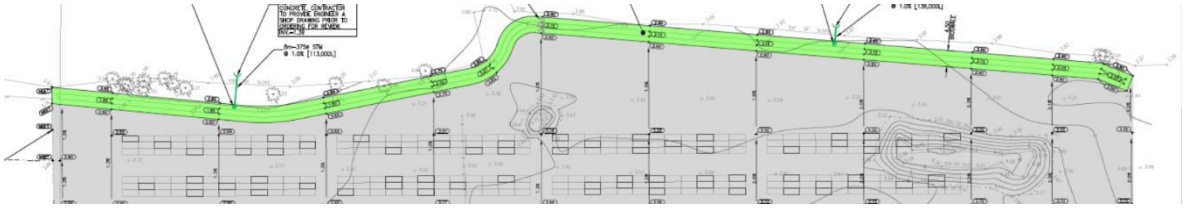


Figure 4. Bioswale design includes the retention of mature trees, located north of the EVL

5.2.2 PFA Manual and Mechanical Vegetation Control

Invasive species, primarily Himalayan blackberry and Scotch broom, were observed in patches within the PFA. Himalayan blackberry is a biennial plant typically found on disturbed sites that quickly spreads by stem and root fragments, as well as through seed dispersal via bird and omnivorous mammal consumption. This species grows aggressively, often outcompeting native vegetation through shading and a build-up of leaf litter and dead stems. Manual control methods (e.g., hand cutting, pulling) can be effective for management of small patches; however, mechanical removal (i.e., excavation) of the entire underground root system is the most effective treatment option for this invasive species. Scotch broom is an evergreen shrub that uses plentiful seed pods to distribute quickly in open, disturbed areas. This invasive species grows year-long, which allows it to outcompete native plants and quickly establish dominance in an area. Manual control is the preferred method of management, as it is the most effective and cost-efficient for this species. Mechanical removal of Himalayan blackberry will aim to eliminate Scotch broom at the same time in the areas where both species are present.

It is recommended that on-Site infestations of invasive species within the PFA (e.g., Himalayan blackberry and Scotch broom) be effectively eradicated through the use of manual (i.e., cutting) and mechanical (i.e., excavation) removal techniques. Manual hand pulling is the most appropriate methodology to target young Scotch broom and young Himalayan blackberry plants. This removal method is most effective when performed during the wet months of the year (e.g., October to March). Cutting, with the use of a brush cutter, will be performed to target the larger, more mature invasive species. Typically, subsequent

planting of competitive native plants with dense root balls [e.g., Pacific ninebark (*Physocarpus capitatus*)] is recommend to help prevent invasive species regrowth; however, future works within the Site to accommodate proposed development (i.e., paving and rail spur installation) are planned to occur approximately 18-24 months after the completion of all control/removal treatments. As such, smothering the removal area with light blocking material (e.g., geofabric blanket) is recommended to minimize the reestablishment of invasive species until planting of native plants/proposed development occurs.

Manual cutting, using a brush cutter, and mechanical removal involving the use of heavy equipment (i.e., excavator) of all invasive species will be conducted within the PFA. Hand pulling young shoots and digging around the Site of infestation can also be implemented. The root mass volume of the invasive species within the PFA may be much larger than the aboveground growth (i.e., depends on vegetation age); therefore, digging should encompass a larger area around the infestation to ensure all root balls/mass of older, more established vegetation are removed). After manual and mechanical removal, invasive vegetation should be carefully handled and allowed to desiccate in the sun until completely brown and dead before transport or disposal. Excavation of the invasive species requires all root material to be removed and disposed of at an approved disposal Site (See Section 5.4 Disposal).

The following presents methodology and BMPs for manual and mechanical removal, and temporary on-Site storage/disposal:

- Hand pull young shoots of the invasive species (e.g., Himalayan blackberry and Scotch broom).

- Cut off all stems of the larger, more mature species with loppers, machete or brush saw as low to the ground as possible;

- Prior to excavation work, ensure Site contractors are trained/briefed on Himalayan blackberry and Scotch broom presence, disposal, and management measures [Note: The Contractor is responsible for sourcing and coordinating with an approved disposal facility before initiating mechanical removal (refer to Section 5.4 of this plan for a list of recommended facilities);

- Use the bucket of an excavator to dig up the underground rhizomal root systems/root balls of the invasive species (e.g., Himalayan blackberry and Scotch broom) within the infested area. Root ball removal has been successful in the past to eradicate these invasive species on other projects of similar nature, and will be a reasonable method to be used in the PFA; however, an EM could be on-Site during excavation works to determine if greater excavation is required.

- Remove cut and excavated vegetation material, and carefully transport in bag or container to a designated on-Site disposal pile (dead plant material is considered

yard waste and can be safely retained on-Site to decay and compost, or be disposed of as 'yard waste');

- The excavated material can also be transferred to trucks and transported to an approved off-Site disposal facility that accepts Himalayan blackberry and Scotch broom plants and/or infested soil (Note: Facilities should be contacted beforehand to confirm they can properly handle the excavated material);

- Smother the treatment area with light blocking material (e.g., plastic sheeting, geofabric blanket, coconut matting) to minimize the reestablishment of invasive species, specifically Himalayan blackberry;

- In a designated washing area, thoroughly wash any personal gear, clothing, vehicles, and equipment that have been used during the excavation process/come in contact with infested soils to prevent the spreading of excavated plant fragments; and

- Prior to leaving the Site, inspect and remove any remaining plant fragments from personal gear, clothing, vehicles, and equipment to prevent transfer of invasive species to other areas of the Site, and off-Site.

5.3 EVL Vegetation Management

5.3.1 EVL Chemical Treatment (for Japanese Knotweed Growth Areas)

Japanese knotweed was observed in small isolated patches within the northern portion of the EVL (Figures 4 and 5, below). Japanese knotweed is a large bamboo-like, perennial shrub that can grow up to five (5) metres tall. This invasive species is a perennial shrub that primarily spreads via a deep, strong underground rhizome (lateral stems) root system, forming dense above-ground thickets and displacing native species in moist to wet areas. Currently, the most effective treatment option for this species, as recommended by ISCMV, is herbicide application (i.e., chemical control). The Province currently has no approved method for stem injection to eradicate this species; however, BMPs have been prepared for the ISCMV (2019) and are referred to, in this VP.

On private lands, knotweed can be treated with herbicide (glyphosate) up to the waters edge by direct stem injection and targeted foliar spray. Direct stem injection is typically best on plants with a stem >2 cm.

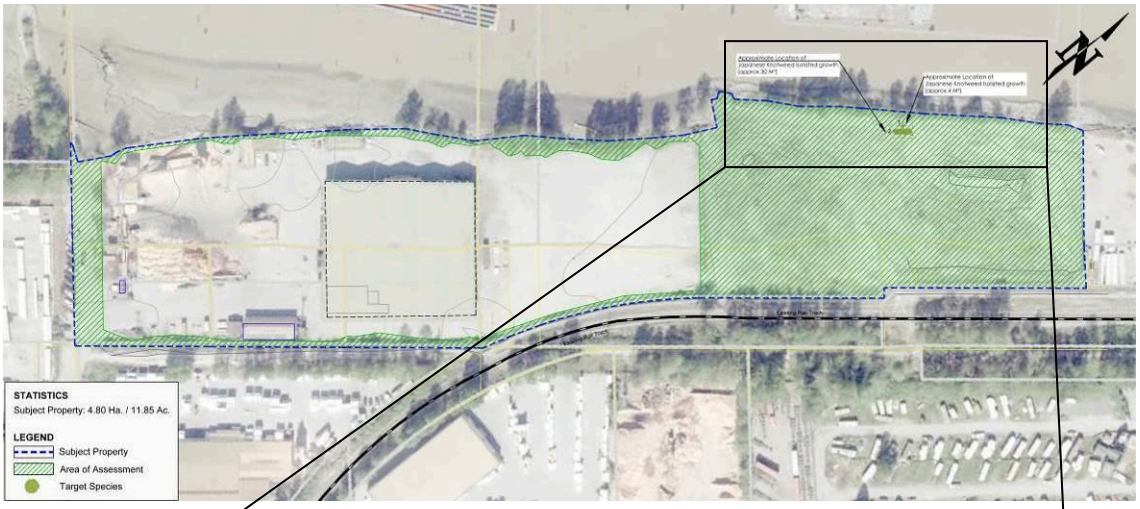


Figure 5. Approximate locations of Japanese knotweed identified within the EVL, along the northern edge of the Site.

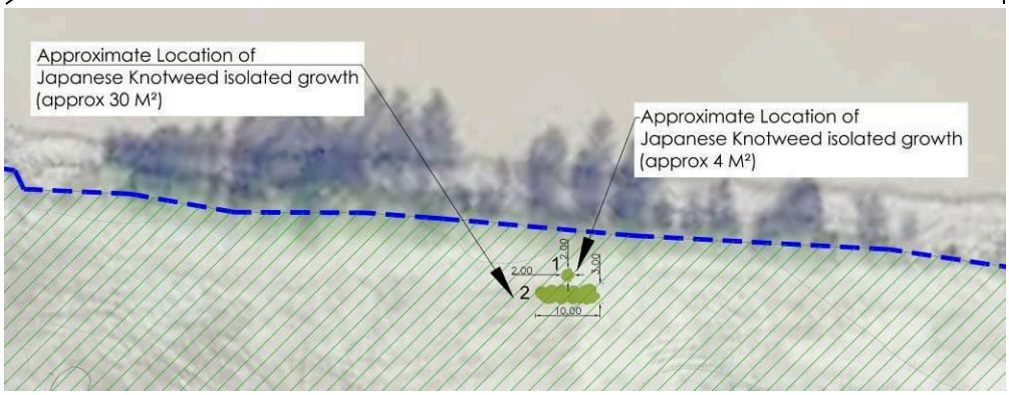


Figure 6. Approximate locations of Japanese knotweed identified within the EVL.

5.3.2 EVL Manual and Mechanical Control – For Other Species

Within the EVL, other invasive species, such as Himalayan blackberry and Scotch broom, were observed in patches.

Himalayan blackberry is a biennial plant typically found on disturbed sites that quickly spreads by stem and root fragments, as well as through seed dispersal via bird and omnivorous mammal consumption. This species has an aggressive growth strategy, often outcompeting native vegetation through shading and a build-up of leaf litter and dead stems. Manual control methods (e.g., hand cutting, pulling) can be effective for management of small patches; however, mechanical removal (i.e., excavation) of the entire underground root system is the most effective treatment option for this invasive species. Scotch broom is an evergreen shrub that uses plentiful seed pods to distribute quickly in open, disturbed areas. This invasive species grows year-long, which allows it to

outcompete native plants and quickly establish dominance in an area. Manual control is the preferred method of management, as it is the most effective and cost-efficient for this species. Mechanical removal of Himalayan blackberry will aim to eliminate Scotch broom at the same time in the areas where both species are present.

It is recommended that on-Site infestations of the other invasive species (i.e., Himalayan blackberry and Scotch broom) be effectively eradicated through the use of manual (i.e., cutting) and mechanical (i.e., excavation) removal techniques. Typically, subsequent planting of competitive native plants with dense root balls [e.g., Pacific ninebark (*Physocarpus capitatus*)] is recommend to help prevent invasive species regrowth; however, future works within the Site to accommodate proposed development (i.e., paving and rail spur installation) are planned to occur approximately 18-24 months after the completion of all control/removal treatments. Concrete paving over top of areas where non-native vegetation is currently growing will also effectively eradicate the growth of these species. It is critical however, that Japanese Knotweed is appropriately treated, as shoots have been documented to penetrate through layers of concrete.

Manual cutting of the other invasive species, using a brush cutter, and mechanical removal involving the use of heavy equipment (i.e., excavator) of all invasive species will be conducted within the EVL. Hand pulling young shoots and digging around the Site of infestation can also be implemented. The root mass volume of the invasive species within the EVL is much larger than the aboveground growth; therefore, digging should encompass a large area around the infestation (specifically Japanese knotweed). After manual and mechanical removal, invasive vegetation should be carefully handled and allowed to desiccate in the sun until completely brown and dead before transport or disposal. Excavation of the invasive species requires all root material to be removed and disposed of at an approved disposal site (See Section 5.4 Disposal).

The following presents methodology and BMPs for combination manual and mechanical removal, and temporary on-Site disposal:

- Cut off all stems of the remaining Japanese knotweed (post chemical treatment) with loppers, machete or brush saw as low to the ground as possible (Note: Care must be taken to ensure no soil/ground disturbance occurs during manual control methods);

- Hand pull and dig around the sites of infestation to ensure complete removal of plant species. Where the invasive species cannot be manually removed, mechanical excavation work will be required;

- Prior to excavation work, ensure Site contractors are trained/briefed on Japanese knotweed presence, disposal, and management measures [Note: The Contractor is responsible for sourcing and coordinating with an approved disposal facility before initiating mechanical removal (refer to Section 5.4 of this plan for a list of recommended facilities);

- Use the bucket of an excavator to dig up the underground rhizomal root systems of the Japanese knotweed within the infested area [Note: Removal of Japanese knotweed requires all root material to be dug up at a minimum of 3 metres deep and up to a maximum of 20 metres wide (ISCMV, 2019)]. Given the isolated nature of the infested areas, we recommend a 2-10 metre excavation width to eradicate the Japanese knotweed (refer to Figure 4, above). This excavation width has been successful in the past to eradicate Japanese knotweed on other projects of similar nature, and will be a reasonable method to be used in this area; however, an EM could be on-Site during excavation works to determine if a greater width is required;

- Carefully transfer excavated Japanese knotweed material (i.e., infested soil and plant material) to the temporarily constructed on-Site disposal area (Note: Cover the excavated material with tarp at the end of each work day to contain the Japanese knotweed until off-Site disposal can occur);

- Remove all cut material and carefully transport using a bag or container, to avoid dropping plant species, to a designated on-Site disposal pile (dead non-Japanese knotweed plant material is considered yard waste and can be safely retained on-Site to decay and compost, or be disposed of as 'yard waste');

- When mechanical removal of Japanese knotweed and all infested soil is complete, the excavated material within the temporary on-Site holding area can be transferred to trucks and transported to an approved off-Site disposal facility that accepts Japanese knotweed plants and/or infested soil (Note: Facilities should be contacted beforehand to confirm they can properly handle the excavated material);

- Smother the treatment area with light blocking material (e.g., plastic sheeting, geofabric blanket, coconut matting) to suppress Japanese knotweed regrowth and minimize the reestablishment of other invasive species;

- In a designated washing area, thoroughly wash any personal gear, clothing, vehicles, and equipment that have been used during the excavation process/come in contact with infested soils to prevent the spreading of excavated plant fragments;

- An excavator can sufficiently scrape the surface of the rest of the EVL and remove other non-native vegetation (i.e., common tansy, dandelion), and

- Prior to leaving the Site, inspect and remove all remaining plant fragments from personal gear, clothing, vehicles, and equipment to prevent transfer of invasive species to other areas of the Site, and off-Site.

5.4 General Decontamination Procedures

In addition to the BMPs provided in the above sections, the following BMPs provide further details on specific decontamination methods (specific to invasive species removal on-Site)

to prevent off-Site transfer of invasive species. Prior to leaving the Site following a day of invasive species removal, all workers should consider the following BMPs:

- Remove all visible plant parts and soil from vehicles and equipment;
- Designate a drum/bag and labelled "contaminated materials", so all workers can dispose of any debris or organic matter in this waste bin and send to the landfill with remaining Site waste; and
- Disinfect vehicles when back at a works yard as follows:
    - Wash with water (minimum 180 degrees F) for a minimum of 10 seconds to remove all debris and organic matter;
    - Use compressed air to remove vegetation from grills/tight spaces; and
    - Sweep and vacuum equipment and vehicle interiors.

5.5 Invasive Species Disposal

For this Project, all Japanese knotweed/other invasive species material and/or infested soil is recommended to be removed and disposed of off-Site at an approved disposal facility. The following facilities may accept Japanese knotweed plants and/or infested soil:

- The Vancouver Landfill
- BC Earth Exchange
- Fraser Valley Aggregates
- Mission Landfill
- Net Zero Waste
- Harvest Power, Fraser River Organics
- WestCoast Lawns/Enviro Smart Organics
- Metro Vancouver's Waste-to-Energy facility

It is recommended to contact all facilities beforehand to confirm that they are equipped to take in the material.

6.0 ENVIRONMENTAL MONITORING PROGRAM

Effectiveness of invasive species removal treatments and subsequent strategic planting of native species will be assessed through ongoing monitoring. A five-year staged monitoring program is recommended whereby, growth of native plants, as well as invasive regrowth will be documented. Site visits should be conducted annually during spring and fall and invasive species regrowth will be addressed before populations can re-establish. Photo point monitoring stations with fixed location and bearing should be established to help identify

which areas are regenerating with invasive vegetation following treatment and which areas are not (key for monitoring Japanese Knotweed infestation, specifically in areas that have been paved). Data and observations from monitoring events should be summarized and made available to the VFPA.

7.0 CONCLUSION

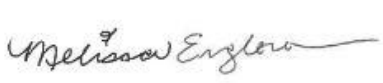
We trust that this VP is sufficient to demonstrate suitable treatment recommendations for the effective control, removal, and management of the native and non-native/invasive species identified within the Site. It is understood that until approval is received by the City of Surrey and/or the VFPA, and all conditions within this VP have been met, no proposed works are to be conducted within the Site.

This report entitled *Vegetation Plan*, has been prepared by Melissa Englouen (Junior Biologist) and Kyla Milne (Bryant; Biologist)

Please contact the undersigned should you have comments or questions regarding this correspondence.

Sincerely,

PACIFIC LAND RESOURCE GROUP INC.



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