

ARBORIST REPORT FOR PROPOSED FAMILY BIKE PARK

160 Seaview Avenue, Salt Spring Island



PREPARED FOR:

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Introduction

The Family Bike Park project is proposed to be built on a lot at 160 Seaview Avenue, Salt Spring Island. This report presents the findings of a tree assessment for this lot which will assist in the planning and building of the park.

Description of the property

The area of the lot is 1.2 acres (0.5 ha) and is located in the south-east corner of Mouat Park. The lot slopes gently to the northeast, and Ganges Creek flows along the northern edge of the property. A detailed description of the property is available in Whitehead 2017a.

Objectives

The project objectives were provided by Elizabeth FitzZaland, Project Manager, and are the following:

- To gather information on tree species, their ages, health, and critical root zones (CRZ)
- Verify the currently identified danger trees
- Examine the property for additional danger trees
- To assist in planning the trail network around the trees, and retaining as many trees as possible
- Identify the critical root zones of the retained trees that are adjacent to the proposed trails
- Identify mitigation measures to reduce the impact of the trails on root zones.
- Identify trees in poor health and discuss options on how to improve their health
- Identify measures that can be taken to protect healthy trees into the future
- Identify the trees that are most ecologically important to the Ganges Creek riparian zone.

Field Visit

A field visit was made to the site on February 13, 2018. The personnel present included James Cowan (Green City Builders) and Kirk Harris (CRD Parks and Recreation). The field visit included the following activities:

- A general description was made of the forest
- Previously identified danger trees were assessed
- A survey was done for additional danger trees and dangerous overhanging branches
- The riparian area was examined, including the trees and existing vegetation
- Mitigation measures to protect the trees during trail construction were discussed
- The amount of acceptable incursion into the root zones of the trees was reviewed

Also during the site visit, in concert with James Cowan, the smaller dead and suppressed trees on the property were assessed for possible removal. Removing these trees will create more space in the understorey and provide more options for locating bicycle paths. About 65 dead and suppressed trees were identified, and marked with a small dot of green paint. Of this amount, about 35 trees were dead, 15 trees were living but were small and suppressed by lack of light, about 10 trees had mechanical damage (such as broken tops and trunk damage), and 5 trees were larger diameter dead trees (>10 cm diameter) that pose a hazard (see Photo 3). Almost all of the dead trees were the result on natural forest succession where, with time, larger trees overtop smaller trees and deprive them of light and root space. The exception to this is the group of dead grand fir along Seaview Avenue which likely died as a result of soil being placed over the roots which impacted soil porosity and reduced the availability of oxygen.

Tree removal should take place before the bird nesting season. Care must be taken to not injure remaining trees when tree removal is underway.

Plans have been made to donate any useable firewood to a local charitable organization, and non-firewood can be used on-site for landscaping or left in other areas of Mouat Park where they can rot naturally and provide amphibian habitat.

General forest characteristics

The tree species present on the property include Douglas fir (*Pseudotsuga menziesii*), grand fir (*Abies grandis*), western red-cedar (*Thuja plicata*), bigleaf maple (*Acer macrophyllum*), and Scouler's willow (*Salix scouleriana*). The majority of the trees are 40 to 60 years old, so the forest is considered to be a "second-growth" young forest (see photo section). Scattered older mature trees are also present. The forest is under active natural succession where larger trees are starting to dominate the forest canopy with the result that smaller trees in the understorey are suppressed and weakened.

Under the provincial biogeoclimatic classification most of Salt Spring Island is in the Coastal Douglas-Fir moist mild zone (CDFmm). Within this zone, the forest ecosystem on the property would be classified as a Douglas-fir - Grand fir – Oregon grape plant association (CDFmm/04). The climax forest (in the absence of disturbances) would be dominated by Douglas-fir, grand fir, with scattered western redcedar and bigleaf maple.

Pathway construction and critical root zones

The critical root zone (CRZ) is defined as a circle on the ground roughly corresponding to the drip-line of the tree. Because the drip-line is often irregular, the best way to determine the CRZ is by measuring the diameter of the tree trunk at breast height (DBH), and then multiplied by factor. Diameter at breast height (DBH) is 1.3 metres off the ground.

The CRZ calculation in inches is: Tree diameter in inches at DBH x 12" (or 1' of CRZ radius per 1" in DBH). In metres, the calculation is 1.2m of CRZ radius for every 10cm of DBH. Based on tree species, age, and soil type, root systems are usually irregular in shape and depth, and in cases root systems can extend beyond the CRZ.

The calculation of critical root zones will be necessary when a pathway is planned close to a tree. In this case, the tree diameter will be measured at 1.3 m, and the CRZ will be calculated. Some incursion into the root zone is acceptable; however it is best to keep the incursion as little as possible. The rule of thumb for pathway inclusion into a CRZ is a maximum of 20-25%. For tree health, it is better to impact those roots that are furthest away from the trunk. If a pathway is placed close to a tree, make sure the opposite side remains undisturbed.

In the case of the bike park, where no excavations are planned, the following steps are recommended for working within a CRZ while still allowing oxygen to reach the tree roots:

- Lay down permeable geotextile cloth
- Apply permeable crushed gravel that covers the roots, as well as filling up the depressions between the roots, leaving a reasonably smooth surface.
- To avoid over compaction, do not pack down the crushed gravel, it will settle with time. To avoid direct contact between bicycle tires and tree roots, aim for a finished gravel thickness of 4 cm.
- Pathways close to trees may need to be inspected on occasion to verify that no damage is being done to roots or trees.
- Excavation of small diameter post holes is acceptable.

Protecting tree health into the future

Following these steps will help to insure the health of tree into the future:

- Avoid soil compaction around trees. Soil compaction makes the soil less permeable to water and oxygen. To reduce the chances of compaction, keep pedestrian and bicycle use at least 1.5 m away from trees
- Using split cedar fences, exclude some areas entirely from pedestrians and bicycles
- Keep trails at least 1.5 m away from any trees
- If trails need go closer than 1.5 m to a tree, consider “bridging” the roots with a low elevated platform
- No excavation on the site except post holes
- When applying gravel on paths, use vehicles with large rubber tires. Another option is to use the “wheel-barrow brigade” to apply the gravel
- No storage of construction materials or re-grading of slopes on the site.

Riparian management

In October 2017 a riparian areas report was done on Ganges Creek by Whitehead Environmental Consultants (Whitehead 2017b). This report describes the creek and fish habitat connected to the creek, as well as the existing riparian vegetation.

This report also has a section on sediment and erosion control, and recommends mitigations such as controlling runoff, and revegetating any erodible bare soil in the bike park.

In addition to the recommendations in this report, we recommend excluding the west side of the creek from pedestrian traffic by installing a cedar split rail fence. Protecting riparian habitat improves habitat for salmon habitat but is also of benefit to birds, mammals, amphibians, and other creatures and plants.

Given the nature of the site, pedestrians will be entering the 10 metre riparian setback (called the Stream Protection and Enhancement Area or SPEA) and children may use the area for playing. However the following activities are not permitted in the SPEA:

- Yard extension from neighbouring properties by mowing down or cutting vegetation
- Dumping of garden refuse or garbage
- Soil disturbance including building unauthorized trails
- Storage or stockpiling of soil or building materials
- Altering the terrain and natural slopes
- Cutting down or removing trees and shrubs
- Applying herbicides, insecticides, pesticides or other noxious materials
- Gardening

Areas of the riparian areas and proposed exclusion zone will benefit from revegetation. However, given the amount of shade from existing trees, only shade tolerant native species should be planted (Table 1). Where gaps are present more light-demanding species can be planted (Table 1). All appropriate native tree species are important in riparian areas – however a mixture of deciduous and conifer species is ideal.

Table 1: List of plants for riparian restoration planting.

Latin name	Common name	Planting location
<i>Malus fusca</i>	Pacific crabapple	gaps
<i>Physocarpus capitatus</i>	Pacific nine-bark	gaps
<i>Alnus rubra</i>	red alder	gaps
<i>Polystichum munitum</i>	sword fern	semi-shade

<i>Mahonia nervosa</i>	low Oregon grape	semi-shade
<i>Lonicera involucrata</i>	black twinberry	semi-shade
<i>Cornus stolonifera</i>	red-osier dogwood	gaps
<i>Oemleria cerasiformis</i>	Indian plum	semi-shade
<i>Rosa nutkana</i>	Nootka rose	gaps
<i>Rubus spectabilis</i>	salmonberry	semi-shade
<i>Prunus emarginata</i>	bitter cherry	semi-shade
<i>Carex obnupta</i>	slough sedge	wet areas in gaps

Replanting in the Bike Park area

After construction of the park, there may be areas suitable for revegetation. These areas may be on the outer edges of the park where there is more light, or within the semi-shade of the forested area. A list of suitable plants is presented in Table 2.

Table 2: List of native shrubs and trees for planting in bicycle park area.

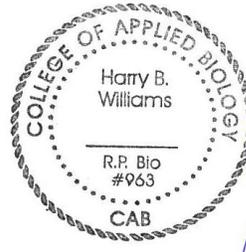
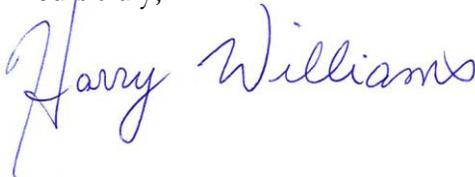
Latin name	Common name	Planting location
<i>Crataegus douglasii</i>	black hawthorn	Forest edges
<i>Malus fusca</i>	Pacific crabapple	Semi-shade and edges
<i>Polystichum munitum</i>	sword fern	Semi-shade
<i>Holodiscus discolor</i>	ocean spray	Full light
<i>Mahonia nervosa</i>	low Oregon grape	Semi-shade
<i>Gaultheria shallon</i>	salal	Forest edges
<i>Oemleria cerasiformis</i>	Indian plum	Semi-shade
<i>Rosa nutkana</i>	Nootka rose	Forest edges
<i>Rosa gymnocarpa</i>	bald-hip rose	Semi-shade
<i>Rubus spectabilis</i>	salmonberry	Semi-shade and edges
<i>Prunus emarginata</i>	bitter cherry	Forest edges
<i>Ribes sanguinum</i>	red-flowering currant	Forest edges
<i>Mahonia aquifolium</i>	tall Oregon grape	Forest edges

The planting program should adhere to these specifications:

- Remove invasive plants prior to planting - English ivy and evergreen daphne (aka spurge laurel)
- Plant in the dormant season
- Use plants that are healthy and at least 2 years old (as tall as possible)

- Space plants on 2 meter centers (approximately), and plant in groups when possible so that they are more visible and easier to protect
- Plant at the proper depth, with the top of the root ball at or just below the soil surface
- Use split cedar fencing as a means of protecting replanted areas and preventing incursion of bikes and pedestrians.

Yours truly,



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References

Whitehead Environmental Consultants 2017a. Environmental Due-Diligence Report for Family Bike Park. Contract report to the CRD, Salt Spring Island BC.

Whitehead Environmental Consultants 2017b. Riparian Areas Regulation: Assessment Report for Ganges Creek. Contract report for Ministry of Environment and CRD, Salt Spring Island BC.



SITE PHOTOS



Photo 1: The large lower branches on two cedar trees need to be removed to lower the risk of dead branches falling on cyclists. The lower branches could be removed with an extended pole pruner. A climber may be required for the higher branches. All cuts should be made flush to the trunk. Dead branches could be removed up to the point where live branches are found.



Photo 2: Example of tree identified for removal: the tree on the left was suppressed and died as a result of lack of light and proximity to the living tree on the right.



Photo 3: A group of about seven dead Grand Fir were found immediately adjacent to Seaview Avenue. It is likely that they died as a result of soil being placed around the trees, and may have been stressed by summer drought and heat. These trees were recommended for removal.

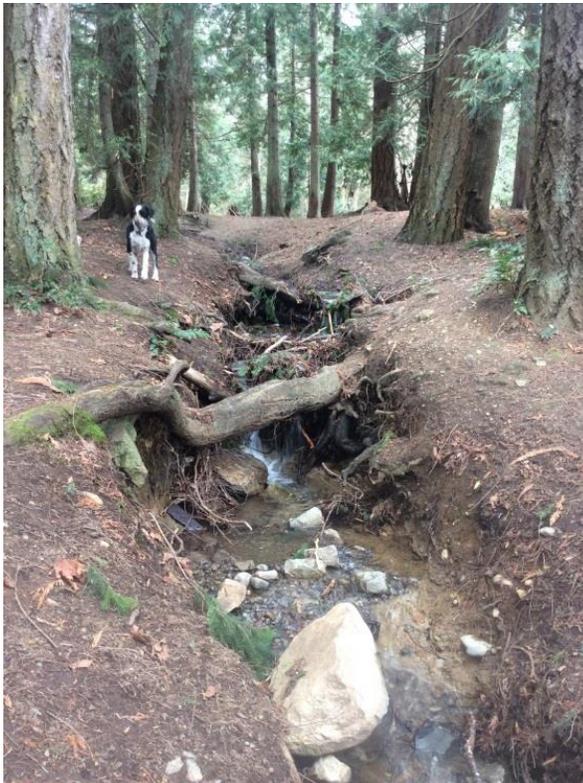


Photo 4: Riparian area: To avoid soil compaction from frequent pedestrian use, create an exclusion zone on the west side of the creek using a split cedar rail fence. This will allow other riparian vegetation to become established.



Photo 5. This photo is taken just west (upstream) from the bike park area. Note that in this area pedestrian traffic occurs on just one side of the creek.



Photo 6. Example of forest grove to be protected by split cedar rail fence.