

OAKWOOD PARK ESTATES ENVIRONMENTAL ASSESSMENT FOR MILLSTONE RIVERFRONT AT 1-1 TERMINAL AVE

PREPARED FOR:
THE CITY OF NANAIMO
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CORVIDAE
ENVIRONMENTAL CONSULTING INC

6526 WATER STREET, SOOKE, BC

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1 INTRODUCTION

Corvidae Environmental Consulting Inc. (Corvidae) is pleased to provide this environmental assessment for the proposed development at 1-1 Terminal Ave, Nanaimo, B.C (the site). This environmental assessment provides the biophysical features of the existing site within the entire project area, impacts of the planned development and mitigation measures to address Nanaimo's bylaws and Official Community Plan (OCP). For this project area DPA 1 – Environmentally Sensitive Areas – applies from the new OCP (2022). During the site assessment the Qualified Environmental Professional (QEP) confirmed that the shoreline at this site location is, in-fact, estuarine (brackish water with tidal influences) and not freshwater habitat.

The City of Nanaimo designates 30 m assessment area from top of bank for this estuarian area of this area of the river, as per zoning bylaw 4500¹. The proposed river shoreline restoration for this project will increase the current vegetated areas from 1210 m² to 2260 m² (see Appendix A, and the landscape design, for details). In addition, the restoration will create a less than 3:1 slope, which would make the present natural boundary (high water mark) be the new top of bank. As shown in Figure 1, there is currently 6.2 m of shoreline that is vegetated at this time (as confirmed during a field assessment on August 4, 2022). The remainder is a paved parking lot. In Figure 1 the top of bank has been identified and the associated 30 m setback from that. To meet the DPA 1 objective of “restore important ESAs in the city” the plan is to remove debris (concrete and garbage) from the shoreline, recontour and plant with riparian vegetation that will provide wildlife habitat and flood mitigation.

The project design is provided in Appendix A and includes a net environmental improvement of the currently impermeable area with restoration of the shoreline, and the addition of greenspace throughout, including rain gardens.

BACKGROUND

The site is currently a paved parking lot and abandoned building. Historically, this area has been disturbed for more than 100 years, due to its central location in Nanaimo. The current condition of the area is derelict buildings and paved areas. This planned project will revitalize this area, adding connecting trails and greenspace, removal of invasive species and improvement of the riparian habitat. It will also meet the City of Nanaimo's objectives in the Master Plan. Specifically, Section 6.4 *Expand and Improve Trail and Greenway System* states that the public favors more trails for walking and cycling, trails being the most requested outdoor facility. The proposed trail extension will be a continuation of well used trail along the shoreline through Maffeo Sutton Park, Georgia Park, Harbourfront Walkway and a commuter cyclist route.

Strongitharm Consulting received a memo from Kevin Brydges, R.P.Bio and Environmental Protection Officer in Development Services with the City of Nanaimo. The memo states that the provincial Riparian

¹ “TOP OF BANK - means the points closest to the natural boundary of a watercourse where a break in the slope of the land occurs such that the natural slope beyond the break is flatter than 3:1 for the required leave strip distance, as seen on Diagram A.” Zoning Bylaw 4500, page 19



Area Protection Regulation (RAPR) does not apply to this section of the river, thus there is no provincial submittal, and the bylaw 4500 applies.² DPA 1 – Environmentally Sensitive Areas.

An estuary is an area where a freshwater river or stream meets the ocean. In estuaries, the salty ocean mixes with a freshwater river, resulting in brackish water. Water continually circulates into and out of an estuary. Water level and salinity rise and fall with the tides.³ From Corvidae's assessment of the location, it is a brackish, estuarine environment with shellfish and marine habitat characteristics along the shoreline of the project area, specific details provided below. Due to this QEP assessment, this is estuarine and not subject to the provincial RAPR.

2 PROPOSED DEVELOPMENT

The northern portion of the project area is within the 30 m assessment area from the top of bank (part of DPA 1 in the 2022 OCP). This area is currently paved, except for 6.2 m of shoreline along the river above the high-tide line (the river in this area is tidally influenced). A path is proposed inside the 30 m DPA assessment, to connect with the existing path along the shoreline in Maffeo Sutton Park. The rest of the 30 m area will include trees, shrubs, forbs, seating, rain gardens and road access (see the design plans for details). All building structures will be located outside of the 30 m DPA area. The community area along the river will add to the connectivity of the adjacent community park and trail system.

The proposed trail will be a 4 m wide continuation of the paved trail from the parks to the east including Maffeo Sutton Park, Georgia Park, Harbourfront Walkway and a commuter cyclist route. The trail will be wheelchair accessible and run along the edge of the future Riverfront Park.




² Kevin Brydges. September 7th, 2021. *Email correspondence*.

³ National Geographic. 2021. *Resource Library: Encyclopedic Entry*. Accessed on: September 23, 2021.





Figure 1: Property Location with current site conditions

 Project Location  Top of Bank
 30 m setback from current Top of Bank

0 25 50 100 150 200 Meters
Project: 1 - 1 Terminal Avenue | Sources: City of Nanaimo, ESRI Basemap



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Corvidae Project No.
COR-2021-113

Rev. #	Date
0	December 1, 2021

Figure 1

3 APPLICABLE REGULATORY FRAMEWORKS

The Provincial Riparian Areas Protection Regulations (December 2019) only applies to freshwater and therefore does not apply to this location, as confirmed by the City of Nanaimo staff.

In consulting the City of Nanaimo Official Community Plan (2022) Schedule 6: Development Permit Areas, DPA 1 – Environmentally Sensitive Areas apply.⁴ Specifically:

*The Development Permit Area designates areas for the purpose of establishing guidelines for the protection of sensitive ecosystems pursuant to Section 488(1)(a)(b) of the Local Government Act, the Riparian Areas Protection Regulations, and the Riparian Areas Protection Act. DPA 1 Environmentally Sensitive Areas is intended to avoid and minimize the impacts of new and redeveloped sites, and to maintain or **restore** important ESAs in the city.*

In addition, zoning bylaw 4500 applies a ‘leave strip’. Due to the current condition of the river shoreline area, the plan is to improve it by removal of debris, recontouring, replanting and then protecting in perpetuity. The leave strip will be a combination of trees, shrubs and forbs that are native species suitable for riparian habitat. The top of bank for the new plan is from the present natural boundary (high water mark) due to a re-contour to a flatter than 3:1 slope. The present natural boundary is defined as “...the visible high water mark of any lake, river, stream or other body of water where the presence and action of the water are so common and usual, and so long continued in all ordinary years, as to mark on the soil of the bed of the body of water a character distinct from that of its banks, in vegetation, as well as in the nature of the soil itself.”⁵

The City of Nanaimo Watercourse Protection states that lakes, wetlands and marine foreshore areas all have 15 m setbacks; and a 30 m setback from the top of bank for the Millstone River estuarian area. The City’s Official Community Plan (OCP) modifies this rule by designating all watercourses, lakes, ponds and their setbacks as Watercourse Development Permit Areas (DPAs) providing suitable restoration and mitigation measures. This allows structures to be built within a setback area, provided a Development Permit (DP) is obtained. The Permit allows for the management of activities that can take place in a watercourse setback and the compensation needed within the setback area to maintain a ‘no net loss’ of habitat.⁶ Within this setback area, non-permanent structures such as trails may be constructed following approval and permitting by the City of Nanaimo.

The updated City of Nanaimo OCP (2022) policies for trail infrastructure have been applied to this project, specifically:

C1.3.19. Where environmental setbacks and constraints allow, support the development of environmentally sensitive trails, viewing points, and rest areas within greenways.

⁴ City of Nanaimo. 2022. City of Nanaimo Official Community Plan. Approved on: July 4, 2022.

⁵ Ministry of Forests, Lands and Natural Resource Operations. 2011. Land Procedure Accretions and Derelictions. Available at: [accrations.pdf \(gov.bc.ca\)](https://www2.gov.bc.ca/gov/content/spe/bc_lands/accr/accrations.pdf). Accessed on: August 3, 2022.

⁶ City of Nanaimo. 2021. Watercourse Protection. Available at: [Watercourse Protection \(nanaimo.ca\)](https://www.nanaimo.ca/watercourse-protection). Accessed on: July 25, 2022.



The rainwater gardens and other landscaped engineering designs are addressing section C1.4 Healthy Watersheds, specifically:

C1.4.2. Incorporate best management practices for new and existing developments to support watershed health, such as pervious paving, rain gardens, bioswales, deep absorbent soils, green / blue roofs, rainwater capture or detention systems, or other best practices and emerging techniques.

This memo also addresses other relevant legislation that must be followed throughout development including:

Provincial

- British Columbia (BC) *Wildlife Act* (1996)
- Invasive Species Council of BC
- *Weed Control Act* (1996, current as of October 2016)

Federal

- Migratory Birds Act (1994)
- Species at Risk Act (2002)
- Fisheries Act (2019)

4 METHODS

DESKTOP REVIEW

Baseline biophysical conditions were compiled by reviewing the best available data and information including existing reports for the area and conducting searches of online provincial and federal databases:

- BC Conservation Data Centre (BC CDC 2021a and 2021b);
- BC HabitatWizard (Province of BC 2021);
- Aerial photographs of the property (Google Earth 2021);
- City of Nanaimo mapping system and database.
- City of Nanaimo bylaw 4500 and 2022 OCP.

FIELD ASSESSMENT

A Qualified Environmental Professional (QEP) from Corvidae conducted a field assessment on September 16, 2021 and August 4, 2022 (see Appendix B for photos). At the time of assessments, it was clear that the area in the project area was tidally influenced, with the High-Water Mark (HWM) (also referred to as the Present Natural Boundary) being estuarine with marine and river influences. The change from marine environment to freshwater was surveyed by the QEP to be approximately 125 m upstream. This was evident by a change in substrate including a change from shellfish occurring in the



marine area, to none in the freshwater area. The site assessment verified the City of Nanaimo Biologist's findings that is an estuarine environment and the RAPR does not apply.

5 ENVIRONMENTAL ASSESSMENT

The property is predominantly a paved area, with shoreline vegetation including with high densities of Himalayan blackberry and English ivy. The shoreline is large rock, with vegetation species listed in Table 1. There are extensive human impacts to the area, indicated by the invasive species, concrete and garbage along the shoreline. Appendix B shows photos of the shoreline vegetation.

CLIMATE AND BIOGEOCLIMATIC ZONE

The project is located within the Coastal Douglas-fir (CDF) biogeoclimatic zone, specifically in the Moist Maritime Coastal Douglas-fir Subzone (CDFmm) (BC CDC 2020b). The CDFmm occurs at low elevations (<150 m) along southeast Vancouver Island, the southern Gulf Islands, and part of the Sunshine Coast. The CDFmm has the mildest climate in Canada. This subzone has a long growing season with warm, dry summers and mild, wet winters.

TERRAIN AND SOILS

Soils in the CDF biogeoclimatic zone, generally derived from morainal, colluvial, and marine deposits, are typically Brunisols, grading with increased precipitation to Humo-Ferric Podzols (Pojar et al. 1991).

The property is sloping steeply to the north, to the river. The shoreline is large rocks and chunks of concrete from historical use.

VEGETATION

Dry forests in the CDFmm zone are typically dominated by Douglas-fir, arbutus, and western redcedar. Grand fir and shore pine may also be present. Salal (*Gaultheria shallon*), dull Oregon-grape (*Mahonia nervosa*), ocean spray (*Holodiscus discolor*), baldhip rose (*Rosa gymnocarpa*), and red huckleberry (*Vaccinium parvifolium*) are common in the shrub layer. Bracken fern (*Pteridium aquilinum*), snowberry (*Symphoricarpos* spp.), grasses, and pacific sanicle (*Sanicula crassicaulis*) are common in the herb layer. Oregon beaked moss (*Eurhynchium oreganum*), step moss (*Hylocomium splendens*), and electrified cat's-tail moss (*Rhytidiadelphus triquetrus*) dominate the well-developed moss layer (Pojar et al. 1991).

The majority of the property is paved. The vegetation in the area includes species listed in Table 1, occurring along the bank of the Millstone River.

At the time of the assessment the tide was ebbing into the wetted area adjacent to the project. The QEP also noted a muddy substrate interspersed with gravels and cobbles covered in barnacles and saltwater mollusks. Given the visual markings of tidal influences on the landscape, marine muddy substrate and abundant presence of saltwater organisms including barnacles and molluscs, the waterbody description of this segment of Millstone River is estuarine.

Table 1. Plant species observed on site during field visit on September 16



Common Name	Scientific Name	BC Provincial Status ¹	SARA Schedule 1 Status ²
Bigleaf maple	<i>Acer macrophyllum</i>	Yellow	--
Canada thistle	<i>Cirsium arvense</i>	Invasive ; Exotic	--
Common snowberry	<i>Symphoricarpos albus</i>	Yellow	--
English ivy	<i>Hedera helix</i>	Invasive ; Exotic	--
Field dock	<i>Rumex pseudonatronatus</i>	Exotic	--
Himalayan blackberry	<i>Rubus armeniacus</i>	Invasive ; Exotic	--
Oceanspray	<i>Holodiscus discolor</i> var. <i>discolor</i>	Yellow	--
Orchard grass	<i>Dactylis glomerata</i>	Exotic	--
Scentless chamomile	<i>Matricaria perforata</i>	Invasive ; Exotic	--
Scotch broom	<i>Cytisus scoparius</i>	Invasive ; Exotic	--
Spurge-laurel	<i>Daphne laureola</i>	Invasive ; Exotic	--
Sword fern	<i>Polystichum munitum</i>	Yellow	--
Trailing blackberry	<i>Rubus ursinus</i>	Yellow	--

¹ BC CDC 2021a² Government of Canada 2021

WILDLIFE

The forested habitat is found in the Coastal Western Hemlock biogeoclimatic zone is home to many wildlife species. Black-tailed deer, black bear, marten and gray wolf are the most common large mammals in this zone on Vancouver Island. For bird species in this zone, the following typically occur: great horned owl, barred owl, ruffed grouse, band-tailed pigeon, northern flicker, hairy woodpecker, common raven, Steller's jay, chestnut-backed chickadee, red-breasted nuthatch, varied thrush, red-tailed hawk, Townsend's warbler. The following amphibians may occur in this biogeoclimatic zone: western toad, Pacific treefrog, western red-backed salamander (Pojar et al. 1991).

The property provides a corridor along the river's edge for wildlife, and the trees provide nesting habitat for birds, and cover for small mammals, amphibians and reptiles.

During the site assessment the species in Table 2 were found on the site.



Table 2. Wildlife Species observed on site during field visit on August 4, 2022

Common Name	Scientific Name	BC Provincial Status ¹	SARA Schedule 1 Status ²
Common gull	<i>Larus canus</i>	Yellow	--
American crow	<i>Corvus brachyrhynchos</i>	Yellow	--
Robin	<i>Turdus migratorius</i>	Yellow	--
Pacific Wren	<i>Troglodytes pacificus</i>	Yellow	--

¹ BC CDC 2021a² Government of Canada 2021

SPECIES AT RISK

A query of the BC CDC iMap tool yielded occurrences of the following 9 species at risk and 3 ecosystems at risk within a two-kilometer radius of the property (BC CDC 2022b). Species are listed in Table 3 and the location of occurrences in relation to the property is provided in Figure 2.

Table 3. Species at risk that may occur in the vicinity of the project area

Common Name	Scientific Name	BC Provincial Status ¹	SARA Schedule 1 Status ²
Species			
American bittern	<i>Botaurus lentiginosus</i>	Red	--
Vancouver Island Beggarticks	<i>Bidens amplissima</i>	Blue	Special concern
Purple martin	<i>Progne subis</i>	Blue	--
Western Painted Turtle	<i>Chrysemys picta</i>	Blue	Special concern
Great blue heron	<i>Ardea herodias fannin</i>	Blue	Special concern
Bog bird's-foot Lotus	<i>Lotus pinnatus</i>	Red	Endangered
Western bumblebee	<i>Bombus occidentalis</i>	Blue	--
Ecosystems			
Douglas-fir / dull Oregon-grape	<i>Pseudotsuga menziesii</i> / <i>Mahonia nervosa</i>	Red	--
Grand fir/ Dull Oregon-grape	<i>Abies grandis</i> / <i>Mahonia nervosa</i>	Red	--

¹ BC CDC 2021a² Government of Canada 2021

CRITICAL HABITAT

A review of CDC iMap (2021) was completed and the Douglas-fir/dull Oregon-grape ecosystem was identified within the property boundary. However, during the site visit it was evident that this ecosystem is not present. The area has been entirely disturbed with invasive species, concrete debris and garbage present. Of the 13 vegetation species documented, 7 of them are invasive/exotic and should be eradicated.



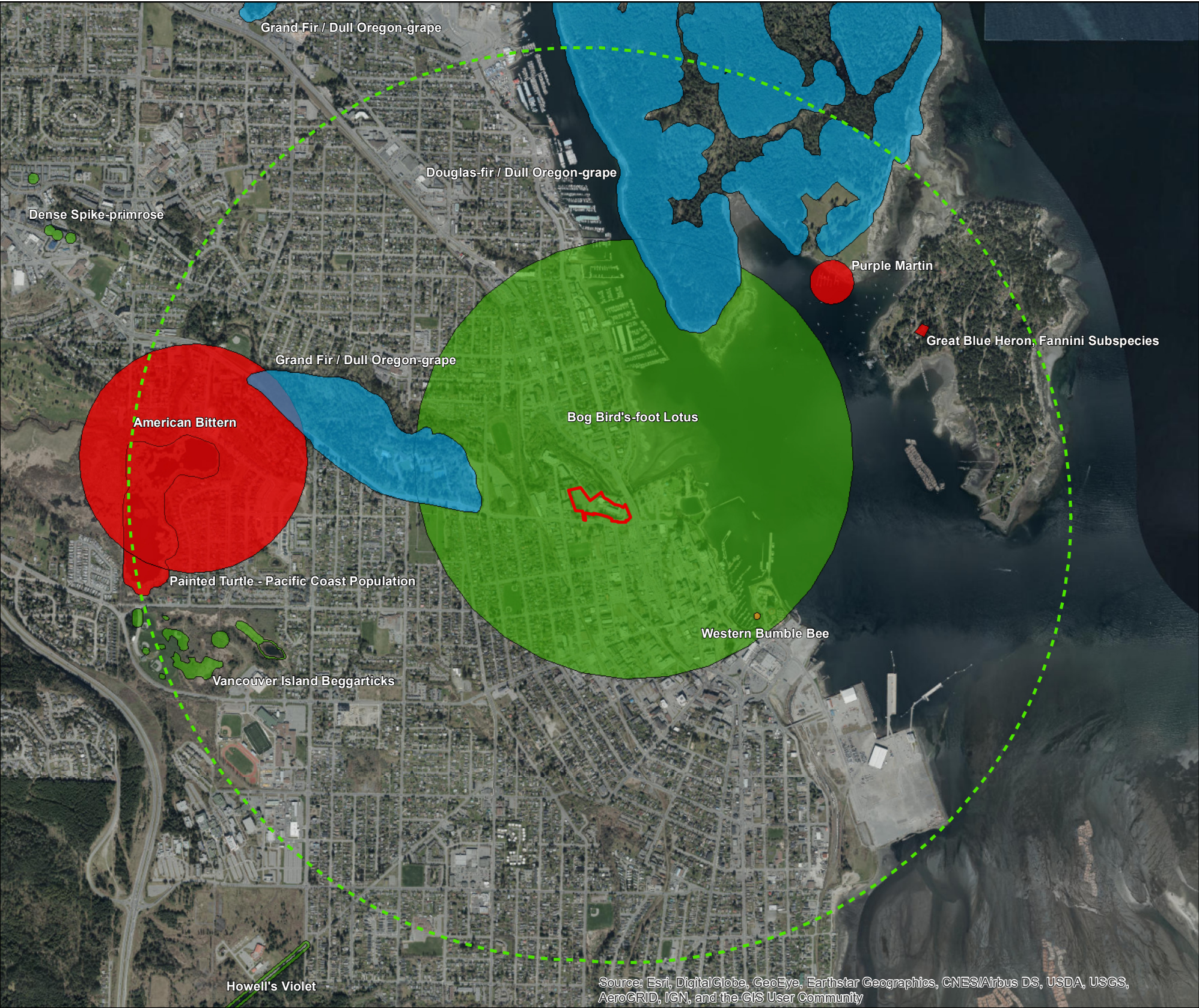


Figure 2: CDC Species at Risk

<div><div><div></div><div>Property Location</div></div><div><div></div><div>2 km area around property boundary</div></div><div><div></div><div>Ecological Community</div></div><div><div></div><div>Invertebrate Animal</div></div><div><div></div><div>Vascular Plant</div></div><div><div></div><div>Vertebrate Animal</div></div></div>	<div><div>N</div><div></div></div> <div><div>CORVIDAE</div><div>ENVIRONMENTAL CONSULTING INC</div></div>	Rev. #	Date
		0	December 1, 2021
<div>Corvidae Project No. COR-2021-113</div>		Figure 2	

0 500 1,000 2,000 Meters

Project: 1 Terminal Avenue | Source: ESRI Basemap, DataBC

6 ENVIRONMENTAL PROTECTION MEASURES

RESTORATION OF DPA 1 AREA

Due to pre-existing disturbance on the subject property, the proposed development would improve the estuarian area by removing existing pavement, removing concrete pieces on the shoreline, removal of debris and invasive species, reducing the slope to flatter than 3:1 and vegetating with native plants (listed in Table 4). There would be a net increase of 1230 m² of pervious area that includes rain gardens, riparian vegetation and grassy areas. Following the shoreline restoration, there is the addition of the following features: a trail that connects with the existing pathways through Maffeo Sutton Park, road access, sidewalks, viewing platforms and drop off parking. These areas will be revegetated with the native species that naturally occur in this ecosystem, including big leaf maple, willow, snowberry and ocean spray (details provided in Table 4). The area directly above the high-water mark will be bioengineered with live willow staking (*Salix pacifica*). *Salix pacifica* naturally occurs, and thrives, along shorelines of marine, estuarine and river habitats on Vancouver Island. The willow will be planted at a high density to account for die-off and create a natural barrier to humans for the riparian habitat. A detailed landscape design plan has been provided as part of the application with the detailed native plant species list (also shown in Tables 4 and 5).

Table 4. Riparian Vegetation Species to be Planted

Species Name	Quantity
<i>Cornus sericea</i>	14
<i>Mahonia Aquifolium</i>	34
<i>Myrica californica</i>	18
<i>Physocarpus capitatus</i>	18
<i>Polystichum munitum</i>	214
<i>Ribes sanguineum</i>	29
<i>Rosa nutkana</i>	36
<i>Salix scouleriana</i>	57
<i>Sambucas racimus</i>	19
<i>Spiraea douglasii</i>	143
<i>Symphoricarpos alba</i>	39

NET REDUCTION IN IMPERMEABLE SURFACES

With the planned development there will be a net increase of 1230 m² of permeable area that will be a combination of riparian vegetation, rain gardens and permeable pavers within the 30 m area. This is a net improvement of vegetation and greenspace from what it is now (see Appendix A). As shown in the design plan, areas that are currently parking lot (within the 30 m area) will become vegetated, with the exception of a portion of sidewalk, trail, vehicle access, view points and terracing for seating.

IMPROVEMENT OF STORMWATER QUALITY

With the proposed design and development there will be rainwater gardens and advanced treatment in run-off into the estuarian environment, in comparison to what is currently on site. Currently the



stormwater runs directly from the parking lot to the river. There are detailed rainwater garden planting plans, with vegetation species listed in the landscape design plan.

The species included in the rainwater garden are provided in Table 5.

Table 5. Rainwater Garden Recommended Species

Trees	
Latin Name	Common Name
<i>Acer griseum</i>	Paperbark Maple
<i>Cornus kousa 'Milky Way'</i>	Milky Way Kousa Dogwood
<i>Nyssa sylvatica</i>	Tupelo
<i>Cercidiphyllum japonicum</i>	Katsura Tree
<i>Chamaecyparis nootkatensis 'Pendula'</i>	Nootka Flase Cypress
<i>Styrax japonicus 'Emerald Pagoda'</i>	Japanese Snowbell
Shrubs	
Latin Name	Common Name
<i>Aster novae-angliae</i>	New England Aster
<i>Carex bunchanii</i>	Leatherleaf Sedge
<i>Carex obnupta</i>	Slough Sedge
<i>Cornus sanguinea 'Midwinter Fire'</i>	Midwinter Fire Dogwood
<i>Polystichum munitum</i>	Sword Fern
<i>Quisetum hyemale</i>	Scouring Rush
<i>Juncus 'Carmen's Grey'</i>	Soft Common Rush
<i>Salix purpurea 'Nana'</i>	Arctic Blue Leaf Willow
<i>Spiraea douglasii</i>	Hardhack
<i>Physocarpus capitatus</i>	Pacific Ninebark
<i>Vaccinium ovatum</i>	Evergreen Huckleberry
<i>Verbena bonariensis</i>	Tall Verbana

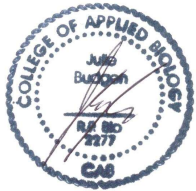


7 CONCLUSION

The northern portion of the project area is within the 30-meter DPA 1 area at the mouth of Millstone River. The area of the Millstone River adjacent to the site is estuarine due to tidal influences from the Salish Sea and thus the RAPR is not required (as confirmed with the City of Nanaimo).

The 30 m setback from the current area has been assessed for this report and environmental protection and improvement measures have been provided in the design plan for the project. The OCP and Bylaw 4500 have been referenced in the design, with the objectives to increase the permeable areas, restore the shoreline habitat, provide sediment control and filtration for stormwater and improve community connectivity in the area. In accordance with City of Nanaimo regulations, the buildings of the proposed development will not encroach into the 30 m setback area. There will be an overall increase of 1230 m² in the 30 m DPA area, with an increase in native vegetation and habitat for wildlife. Overall, it will be an improvement from what is currently in place including an increase in greenspace, removal of invasives, decrease of paved areas, removal of debris and beautifying the currently derelict area.

Report Prepared By:



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Senior Environmental Planner,
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8 REFERENCES

- British Columbia Conservation Data Centre (CDC). 2021a. BC Species and Ecosystems Explorer. B.C. Ministry of Environment. Victoria, B.C. Available: <http://a100.gov.bc.ca/pub/eswp/>. Accessed: February 2021.
- British Columbia Conservation Data Centre (CDC). 2021b. CDC iMap [web application]. Available at: <http://maps.gov.bc.ca/ess/sv/cdc/>. Accessed: November 2021.
- British Columbia Ministry of Environment (MOE). 2014a. Procedures for Mitigating Impacts on Environmental Values (Environmental Mitigation Procedures) Version 1.0.
- British Columbia Ministry of Environment (MOE). 2014b. Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia. Available at: <https://www2.gov.bc.ca/gov/content/environment/natural-resourcestewardship/naturalresource-standards-and-guidance/best-managementpractices/develop-with-care>.
- British Columbia Ministry of Environment. 2004. *Environmental Best Management Practices for Urban and Rural Land Development*
- British Columbia Ministry of Environment. 2009. *A User's Guide to Working in and Around Water*.
- British Columbia Ministry of Environment. 2014b. Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia. Available at: <https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/natural-resource-standards-and-guidance/best-management-practices/develop-with-care>.
- City of Nanaimo. 2022. City Plan, Nanaimo Reimagined, May 2022. (Nanaimo's OCP). Approved July 4, 2022.
- Government of Canada. 2021a. Species at Risk Public Registry. Available at: <https://www.canada.ca/en/environment-climate-change/services/species-risk-publicregistry.html>. Accessed: November 2021
- Government of Canada. 2021b. General nesting periods of migratory birds. Available at: <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods/nesting-periods.html>. Accessed November 2021.
- Pojar, J., K. Klinka, and D.A. Demarchi. 1991. Coastal Western Hemlock Zone. In *Ecosystems of British Columbia*. D. Meidinger and J. Pojar (editors). B.C. Ministry of Forestry, Victoria, B.C. Spec. Rep. Ser 6. Pp 95-111.



APPENDIX A – DESIGN PLAN





THIS DOCUMENT HAS BEEN ELECTRONICALLY CERTIFIED WITH DIGITAL CERTIFICATE AND ENCRYPTION TECHNOLOGY AUTHORIZED BY THE AIBC. THE AUTHORITATIVE ORIGINAL IS IN ELECTRONIC FORM. ANY PRINTED VERSION CAN BE RELIED UPON AS A TRUE COPY OF THE ORIGINAL. WHEN SUPPLIED BY D'AMBROSIO architecture + urbanism, BEARING IMAGES OF THE PROFESSIONAL SEAL AND DIGITAL CERTIFICATE OR WHEN PRINTED FROM THE DIGITALLY CERTIFIED ELECTRONIC FILE.

- NOTES:
1. Development scenario based on preliminary information and assumptions subject to changes and verification.
 2. Topographic information shown on the site has been manipulated from the existing and is preliminary in nature. Please refer to the legal survey for existing topographic information.
 3. Riparian setbacks and Natural Boundary are shown as per the legal survey provided by Turner and Associates and JE Anderson & Associates and are preliminary in nature. Both will need to be confirmed.
 4. Top of Bank established based on City of Nanaimo definition. Exact location will need to be confirmed.
 5. Floor Area Ratio (FAR) is shown inclusive of allowable base density and the additional requirements to achieve maximum allowable density within the zone based on providing 100% of required parking underground.
 6. Project Data is calculated as per City of Nanaimo Regulations.
 7. All numbers are approximate and subject to confirmation of technical and regulatory requirements.
 8. Density calculations are based on gross site area and are inclusive of road area and open space area.
 9. Lot numbers have been assigned for the purposes of this study. Lot lines are diagrammatic. All legal information to be prepared by qualified BCLS.

5	Issued for Review	08/09/2022
4	Re-issued for RZ Tech. Upd. 3	07/29/2022
3	Re-issued for RZ Tech. Upd. 2	06/03/2022
2	Re-issued for RZ Tech. Update	05/17/2022
1	Issued for Rezoning App.	07/22/2021

rev no	description	date
5	Issued for Review	08/09/2022

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project name
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Design Plan**

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APPENDIX B – SITE PHOTOGRAPHS

Photo 1. Looking at the shoreline of Millstone River and adjacent vegetation. September 2021.



Photo 2. Example of shoreline vegetation along Millstone River. The invasive English Ivy was seen in abundance. September 2021.



Photo 3. Mud, gravel and cobble substrate on the floor of Millstone River. Marine species including barnacles and mollusks were observed in abundance indicating the area is estuarine. September 2021.



Photo 4. Looking at the wetted width and highwater mark of Millstone River. September 2021.

