

VANCOUVER FRASER PORT AUTHORITY  
WSP PROJECT NUMBER: 20M -00758-00

# FRASER SURREY PORT LAND – TRANSPORTATION IMPROVEMENTS SPECIES-AT-RISK ASSESSMENT REPORT

MAY 14, 2021

CONFIDENTIAL





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VANCOUVER FRASER PORT AUTHORITY

REPORT

PROJECT NO.: 20M-00758-00

CLIENT REF:#20-0173

DATE: MAY 14, 2021

WSP

840 HOWE STREET, SUITE 1000

VANCOUVER, BRITISH COLUMBIA

T: 604-631-9694

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May 14, 2021

Confidential

Vancouver Fraser Port Authority  
Senior Construction Project Specialist  
100 The Point, 999 Canada Place  
Vancouver, B.C.  
V6C 3T4

**Attention: Vinil Reddy, M.Sc., MBA, PMP, P.Eng., ENV SP**

Dear Madam/Sir:

**Subject: Fraser Surrey Ports Land Transportation Improvement –  
Species at Risk Assessment Report  
Client ref.:**

WSP is please to submit our Species at Risk Assessment Report for your review and consideration. The Species at Risk Assessment Report presents the preliminary survey and assessment of species at risk, for the proposed activities for the construction and operations of the Fraser Surrey Port Lands Transportation Improvement Project.

We look forward to working with you on this Project to ensure successful and compliant delivery of services.

Yours sincerely,

A handwritten signature in black ink that reads "R. Smedley". The signature is written in a cursive, flowing style.

Rosalyn Smedley, M.Sc., R.P.Bio.  
Biologist

WSP ref.: 20M-00758-00

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# SIGNATURES

## PREPARED



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Rosalyn Smedley, M.Sc., R.P.Bio  
Biologist

14 May 2021

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Date



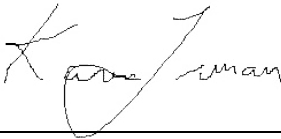
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Susan Blundell, M.Sc., R.P.Bio  
Plant Ecologist

14 May 2021

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Date



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Karen Truman, M.Sc., R.P.Bio  
Wildlife Biologist

14 May 2021

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Date

## APPROVED<sup>1</sup> BY



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Michael Taylor, BLA, MRM  
Team Lead, Ecology & EIA

14 May 2021

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Date

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# CONTRIBUTORS

## WSP

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Plant Ecologist Susan Blundell, M.Sc., R.P.Bio.

Wildlife Biologist Karen Truman, B.Sc., R.P.Bio.



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# 1 INTRODUCTION

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## 1.1 PROJECT BACKGROUND AND RATIONALE

As a component of the Greater Vancouver Gateway 2030 Program, the Fraser Surrey Port Lands – Transportation Improvements Project (FSPL-TI) (the “Project”), includes an options confirmation review and preliminary engineering design of new or upgraded transportation infrastructure within the City of Surrey FSPL. The Greater Vancouver Gateway 2030 Program is the Gateway Transportation Collaboration Forum’s strategy for smart infrastructure investment in removing bottlenecks impeding the growth of trade, while addressing community impacts on good movement and population growth. The primary purpose of the Project is to improve the road network within FSPL and ease congestion in the general area.

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## 1.2 PROPOSED WORKS

The three main components of the FSPL-TI project include:

1. At- Grade Railway Crossing Updates: With extensive amounts of un-signalized railroad crossings along Timberland Road North, vehicles drivers experience stop-go movements as they approach crossings which add delays to already slow-moving traffic in the area. Upgrading the at-grade rail crossings at FSPL will improve the safety and efficiency of road users driving within FSPL.
2. New Roadway Connection for Timberland Road South to Robson Road: Re-alignment of the Robson Road-Timberland Road North corridor with the introduction of the Timberland Road South as the main access road within FSPL will enable most road users to avoid conflicts with at-grade rail crossing along the existing Timberland Road North. Road widening along Timberland Road South, including a new signalized intersection at Timberland Wye is proposed as part of this Project. The project will also provide the long-term rail footprint in the area for trains servicing the planned future terminals. With majority of truck traffic being directed to the new road alignment, this eases up traffic flow on the existing Timberland Road.

Changing the inbound container truck movements by providing a dedicated truck auxiliary lane, complete with Vehicle Access Control System (VACS) gates will manage inbound truck traffic into DP Word Fraser Surrey (DPWFS) container gate and streamline traffic flow.

3. Pavement Rehabilitation and Pavement Markings along Robson Road: Rehabilitation of Robson Road to address pavement and drainage issues which contributes to the overall operation of the road corridor and maintenance costs at FSPL. Enhancement of pavement markings along Robson Road will allow for better lane usage.

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## 1.3 OBJECTIVES

The objectives of the Species at Risk Report are to:

- Identify all federal and provincial listed species at risk associated with the proposed Project.
- Include a description of potential impacts and proposed mitigation strategies.

Detailed project description and methodology for desktop review and field site visit are available in the Biophysical Survey and Assessment Report. The Biophysical Report also provides a full description of





project effects and proposed mitigation measures. This document provides a summary of that information as it pertains to species at risk.

## 2 EXISTING CONDITIONS

### 2.1 SPECIES AT RISK IN THE PROPOSED PROJECT AREA

There are four species at risk identified in the project footprint or within 100 m of the project footprint. This includes one fish species and three plant species. Table 1 below provides a summary of those species recorded within the Project footprint, and 100 m buffer from the project footprint. A description of these species and their habitat is available in the sections below.

**Table 1 - Species at Risk that may be associated with the Proposed Project**

Common Name	Scientific Name	BC Listing	COSEWIC/ SARA	Date Observed	Project Footprint	Project Area (100 m Buffer)
Coastal Cutthroat Trout	<i>Oncorhynchus clarkii clarkii</i>	Blue	Not applicable	2012	Yes	Yes
Streambank lupine	<i>Lupinus rivularis</i>	S1 (Red)	Schedule 1 / E (Nov 2002)	July 2013	Yes	Yes
Two-edged water-starwort	<i>Callitriche heterophylla</i> var. <i>heterophylla</i>	SU	Not applicable	Sept 10 1989	No	Yes
Vancouver Island beggarticks	<i>Bidens amplissima</i>	S3 (Blue)	Schedule 1 / SC (Nov 2001)	Sept 6 1988	Yes	Yes

Provincial Status:

Red: Includes any indigenous species or subspecies that have- or are candidates for- Extirpated, Endangered, or Threatened status in British Columbia. Not all Red-listed taxa will necessarily become formally designated.

Blue: Includes any indigenous species or subspecies considered to be of Special Concern (formerly Vulnerable) in British Columbia. Blue-listed taxa are at risk, but are not Extirpated, Endangered or Threatened.

S1=Critically imperiled: S3=Special concern, vulnerable to extirpation or extinction; and SU=Unrankable.

SARA (*Species at Risk Act*) ranking:

The date that the rank was last reviewed is presented in parentheses.

E = ENDANGERED: A species facing imminent extirpation or extinction.

SC = SPECIAL CONCERN: A species of special concern because of characteristics that make it particularly sensitive to human activities or natural events.

### 2.2 FISH AND FISH HABITAT

According to the DFO Aquatic Species at Risk Map, no fish species at risk were identified overlapping with the Project area and no Critical Habitat has been identified by DFO. No critical habitat is shown on the BC CDC iMap. The Coastal Cutthroat Trout is provincially Blue-listed. No Critical Habitat has been mapped on Manson Canal. According to the City of Surrey COSMOS Map, Manson Canal is classified as Fish Class A, inhabited by fish year-round or potentially year-round. Class A is considered 'streams' as defined by the Provincial *Water Sustainability Act* and Riparian Areas Protection Regulation and fish habitat as defined by the *Federal Fisheries Act*.



The Timberland Road Ditch, located in the west portion of the Project footprint, does not have publicly available data for fish presence/distribution; however, it is classified as Fish Class B by the City of Surrey, which indicates that it provides food / nutrient value to downstream fish habitat. No fish potential present at any time of the year but Class B watercourses are defined as “stream” both provincially and federally.

During the site visit conducted in December 2020, good habitat availability was observed in Manson Canal, Shadow Brook and an unnamed tributary to Shadow Brook. Drainage ditches that flow into Manson Canal were considered to have poor to no habitat for salmonids due to lack of suitable substrates for spawning, low flows, or absence of channelization.

---

## 2.3 RARE/SENSITIVE VEGETATION AND ECOLOGICAL COMMUNITIES

A Sensitive Ecosystem Inventory (SEI) was conducted for Metro Vancouver based largely on 2009 aerial photography (Metro Vancouver, 2020). The SEI identifies and maps ecologically significant and relatively unmodified Sensitive Ecosystems, including wetlands, older forests and woodlands using provincial standards. No SEIs, parks, protected recreation or conservation areas were identified with the Project area by Metro Vancouver however the City of Surrey has identified portions of the Project Area as Sensitive Ecosystem Development Permit Areas (Figure 1).

A summary of the rare / sensitive plant species, as documented by the BC Ministry of Sustainable Resource Management, is provided in Table 2 below and shown in Figure 2. There are rare ecological communities identified for the Coastal Western Hemlock Very Dry Maritime (CWHxm1) subzone. Sixteen communities have been identified within the CWHxm1 subzone in Surrey; 3 within the Flood ecosystem group, 12 within the coniferous forest ecosystem group and 1 within the grassland ecosystem group. Due to the anthropogenic disturbances within the Project footprint it is unlikely that any are present. The field survey conducted in April 2021 confirmed this; no rare plant communities were observed within the Project footprint.

Two clusters of Streambank lupine are overlapped by the Project footprint along Timberland / Robson Roads and the associated rail lines. A third population of Streambank lupine, located at the southern end of the Project, is not directly affected but falls within the Project area (100 m buffer). A federally designated 50 m Critical Habitat buffer applies to these Streambank lupine areas. The Recovery Strategy for the Streambank Lupine (Environment Canada 2016) describes the current status of the species, protection measures implemented and supporting information for working in areas where it is present.

Existing Permit no. SARA-PYR-2019-0480 authorizes the Vancouver Fraser Port Authority to harm and kill individuals (seed, seedlings and mature plants) of Streambank Lupine during the clearing of habitat identified as Critical Habitat, for the expansion of railway lines at Site 2b and during habitat enhancement activities at Site 2a (Government of Canada, 2019). Site 2b appears to overlap with the Project area and site (Streambank Lupin Recovery Team, 2014). As part of the SARA permit application, the Vancouver Fraser Port Authority proposed to offset any disturbance at Site 2b by enhancing the nearby sub-population of streambank lupine identified in Site 2a, located south of Site 2b near Alaska Way. The enhancement works in Site 2a are approved under the SARA permit. The permit includes enhancement and monitoring activities at Site 2a over a 5-year period and includes the removal of competing vegetation and appropriate maintenance activities to encourage seed germination and seedling establishment (e.g. watering and fine-scale vegetation maintenance).

Streambank lupine naturally occupies open, nutrient-poor, sandy or gravelly, river or creek bank sites at low elevations proximal to the coast, generally having little competitive ground cover (COSEWIC 2002).

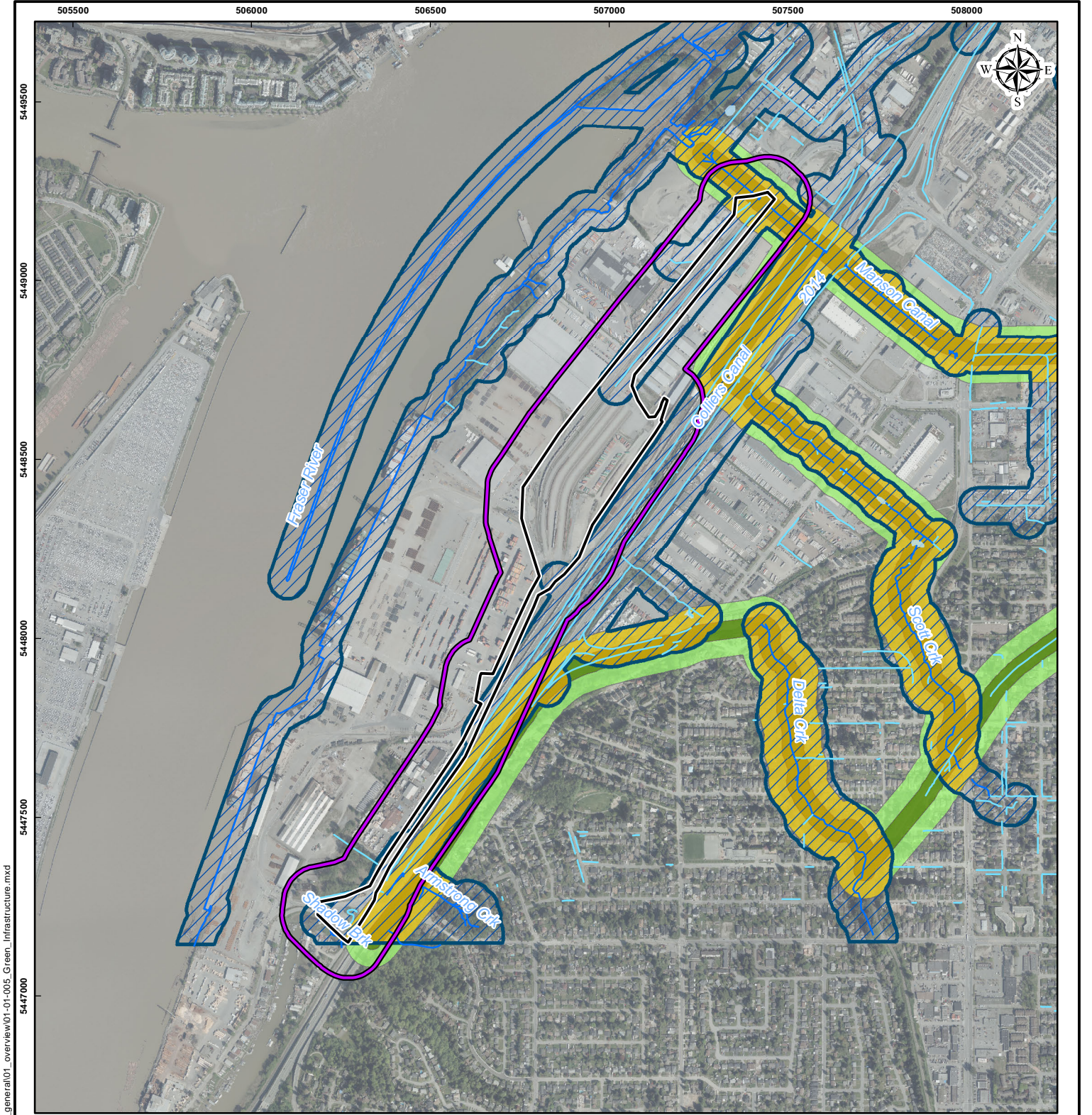


These habitats are usually prone to flooding and are frequently scoured and modified. Streambank lupine often use highly disturbed habitat for annual colonization, likely to avoid competitive exclusion of other plants. Typical habitats where this species survives today include railway right of ways (ROWs), roadside edges, open industrial sites, and dykes, many of which are frequently cleared of vegetation or disturbed in other ways. Many of the potential sites where this species might occur were heavily colonized by Himalayan blackberry and reed canary grass, excluding other species. During the field survey conducted in April 2021 no occurrences of Streambank lupine were observed.

A single small clump of two-edged water-starwort was observed submerged at high tide along the muddy shore of Mason Canal on September 10, 1989. Not directly overlapped by Project as it is located ~ 90 m north of Project's northern limits. No two-edged water-starwort were observed during the April 2021 survey or are anticipated to be affected by the Project.

No Vancouver Island beggarticks were observed on September 12, 2008, despite extensive surveys of ditches southwest of Grace Rd. and Fraser Way, on the east side of Bridge Road and along the railway up to 200 m east of previously reported location. The CDC data search indicated that this species was last observed (and samples collected) on September 6, 1988 (Figure 2). Vancouver Island beggarticks were not observed in the Project footprint during the April 2021 assessment but seedlings of this annual species typically appear in mid to late April or May so it is possible that seedlings were not present at the time of the assessment. No suitable habitat was observed during survey; this species occurs on narrow alluvial shoreline margins of lakes, ponds, creeks, bogs, tidal estuaries, and in ditches and other wet areas that undergo annually fluctuating water levels, summer drawdown, and siltation. Although ditches were observed, water levels were already extremely low and the degree of invasive plant colonization and the extremely poor water quality likely limits the potential for this species to occur.

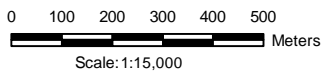





**Legend**

- Populated Place
- Ditch
- Creek and River
- Waterbody
- Wetlands
- Parks
- Project Footprint
- Study Area
- Green Infrastructure Network Corridors

- Sensitive Ecosystems Development Permit Area
- Streamside Areas
  - Green Infrastructure Areas
  - Streamside and Green Infrastructure intersect




References:  
 Data BC - BC Catalogue  
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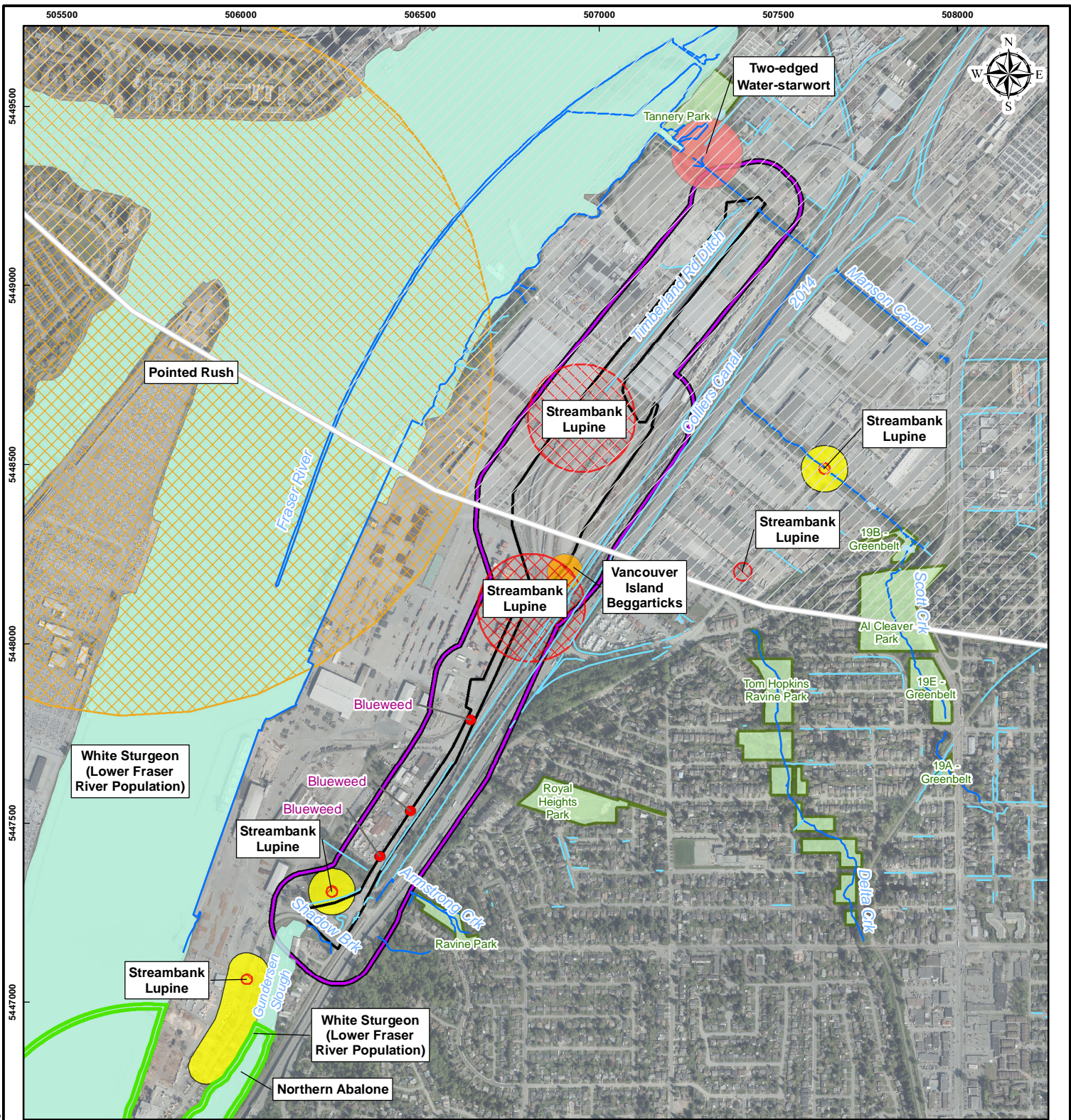
CLIENT:  
 Vancouver Fraser Port Authority

PROJECT:  
 Fraser Surrey Port Lands - Transportation Improvements Preliminary Design Services

TITLE:  
**Green Infrastructure & Streamside Areas**

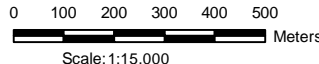
DATE: June 09, 2020	PROJECT NO: 20M-00758-00	<b>Figure 1</b>
GIS FILE: 01-01-005_Green_Infrastructure.mxd		
COORDINATE SYSTEM: NAD 1983 UTM Zone 10N		
ANALYST: MY	REVIEWED: SB	





**Legend**

- Populated Place
- IAPP Invasive Plant (Blueweed)
- Ditch
- Creek and River
- ▭ Project Area (100m)
- ▭ Study
- ▭ Parks
- ▭ Streambank Lupine Critical Habitat
- ▭ Waterbody
- ▭ Wetlands
- ▭ CDC Masked Sensitive
- CDC Non Sensitive
- ▨ Pointed Rush
- ▨ Streambank Lupine
- Two-edged Water-starwort
- ▨ Vancouver Island Beggarticks
- ▨ White Sturgeon (Lower Fraser River Population)
- ▨ DFO Aquatic Species at Risk Distribution 2019
- ▨ Northern Abalone



References:  
Data BC - BC Catalogue  
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NRCAN Geogatis  
Open Government License  
(<http://geogatis.cgdi.gc.ca/>)

CLIENT: Vancouver Fraser Port Authority	
PROJECT: Fraser Surrey Port Lands - Transportation Improvements Preliminary Design Services	
TITLE: <b>Rare / Sensitive Species, Critical Habitat and Invasive Species</b>	
DATE: June 11, 2020	PROJECT NO: 20M-00758-00
<b>Figure 2</b>	
GIS FILE: 01-01-004_Enviro_Feature.mxd	
COORDINATE SYSTEM: NAD 1983 UTM Zone 10N	ANALYST: MY
	REVIEWED: SB

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## 2.4 RARE/SENSITIVE WILDLIFE AND ASSOCIATED WILDLIFE HABITAT

Following a review of the Project site characteristics, historical observations and available information sources, it appears that there is minimal potential for rare/sensitive wildlife species to use the Project area. However, the Project overlaps the northern limits of a secured CDC mapped area, identified as Object ID: 38160 (Figure 2), and a request was set to the CDC to clarify if the proposed Project overlaps with the secured CDC mapped area. The response noted that the masked species will not interact with the proposed Project and that the occurrence is over 1km away from the Project footprint.

Due to the proximity of the Fraser River there is the potential for various bird species to visit the Project area. It is highly unlikely that rare or sensitive bird species inhabited the Project footprint and 100 m buffer due to limited habitat and on-going disturbance. The Provincial *Wildlife Act* provides protection for the eggs and active nests of all birds during breeding season. Section 34 of the *Act* states "A person commits an offence if the person, except as provided by regulation, possesses, takes, injures, molests or destroys:

- (a) a bird or its egg;
- (b) the nest of eagle, peregrine falcon, gyrfalcon, osprey, heron or burrowing owl; or
- (c) the nest of a bird not referred to in paragraph(b) when the nest is occupied by a bird or its egg."

By default, protection of nests includes the protection of the trees containing them. Subsections 34(a) and (c) have generally been interpreted to protect the active nests of all birds during breeding season, which can begin in February and continue through August 15. The nests of the six birds listed in subsection (b) of the Provincial *Wildlife Act* are protected regardless of the time of year, or whether or not they are active. At the Federal level the *Migratory Birds Convention Act* (1994) provides similar protection for all migratory birds, during the breeding season in the Lower Mainland which is approximately March 1 to August 31 (Birds Canada, 2020).

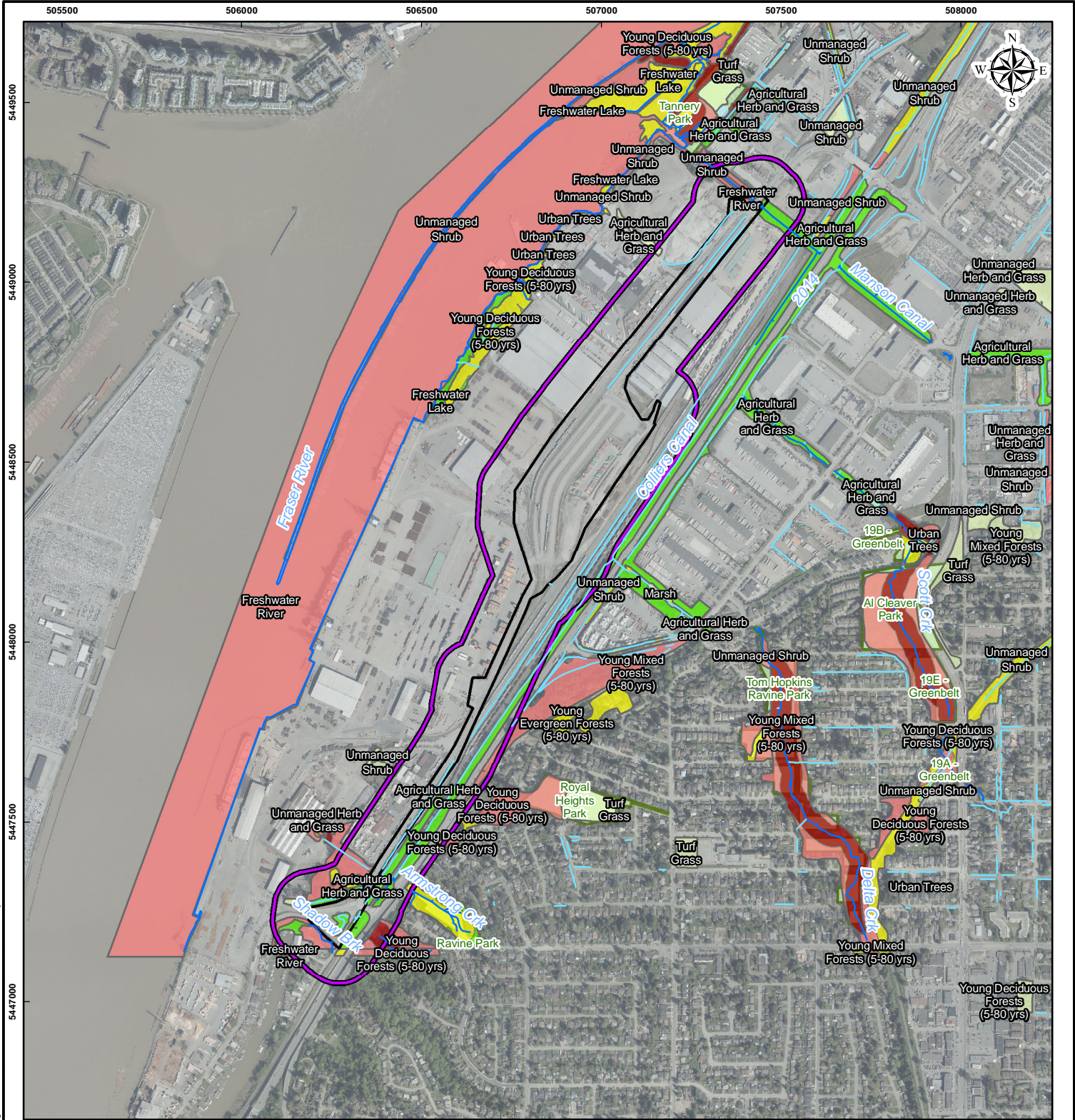
The City of Surrey has an inventory of vegetation communities and their habitat suitability ranking for wildlife based on the habitat type of the mapped polygon (Figure 3). The ecological value was identified as very high, moderate high, moderate, low and very low. The higher end of the rankings was found on the more natural environments including creeks and their riparian areas, and forested parks. The lower valued habitat occurred in rights-of-way and open space parks. The higher ranked habitat suitability polygons occur in the southern portion of the Project area however most of it is located outside the Project footprint.

The City in cooperation with the BC Nature Wildlife Tree Stewardship program maintains a database of bald eagle nests. An eagle nest tree is noted south of the Project area near the Alex Fraser Bridge on the south bank of the Fraser and another on the south bank of the Fraser River across the northern end of Annacis Island however both nests no longer exist. Two new nest sites were noted during the April 2021 site visit however the current nesting status is unknown (Figure 4A, 4B).

### 2.4.1.1 IMPORTANT BIRD AREAS

The Boundary Bay - Roberts Bank - Sturgeon Bank (Fraser River Estuary) Important Bird Area (IBA BC017) is a large interconnected mix of marine, estuarine, freshwater and agricultural habitats that includes the waters of Sturgeon Bank, between the north and south arms of the Fraser River, and Roberts Bank, south of the south arm of the Fraser River. This IBA is rated as follows: globally significant for Congregatory Species, Waterfowl Concentrations, Colonial Waterbirds/Seabird Concentrations, Shorebird Concentrations; continentally Significant for Congregatory Species; and Nationally Significant for Threatened Species, Congregatory Species, Wading Bird Concentrations. Threats to IBA BC017 associated with the Project would be limited to direct and indirect effects on the aquatic environment associated with construction activities and improved / increased traffic.



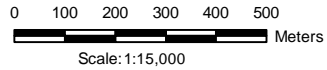


**Legend**

- Populated Place
  - Ditch
  - Creek and River
  - Waterbody
  - Wetlands
  - Parks
  - Project Footprint
  - Study Area
- Suitability Ranking
  - Very High
  - Moderate High
  - Moderate
  - Low
  - Very Low



References:  
 Data BC - BC Catalogue  
 Open Government License  
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 NRCAN Geogratis  
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 (http://geogratis.gc.ca/)



CLIENT:		<b>PORT of vancouver</b> Vancouver Fraser Port Authority	
PROJECT:		Fraser Surrey Port Lands - Transportation Improvements Preliminary Design Services	
TITLE:		Habitat Suitability	
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June 09, 2020	20M-00758-00		
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NAD 1983 UTM Zone 10N		MY	SB



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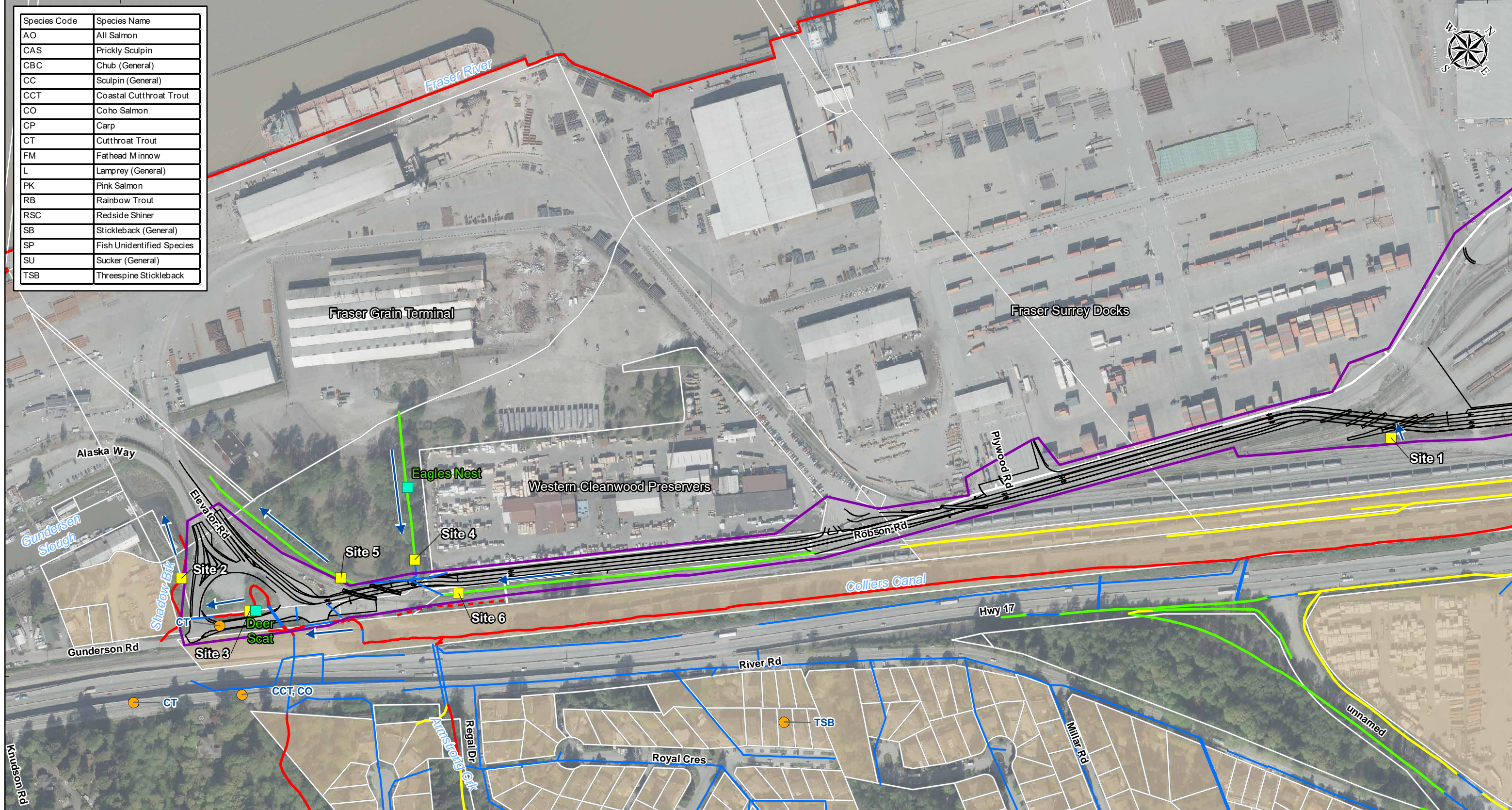
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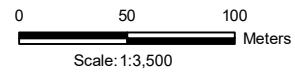
5448500

Species Code	Species Name
AO	All Salmon
CAS	Prickly Sculpin
CBC	Chub (General)
CC	Sculpin (General)
CCT	Coastal Cutthroat Trout
CO	Coho Salmon
CP	Carp
CT	Cutthroat Trout
FM	Fathead Minnow
L	Lamprey (General)
PK	Pink Salmon
RB	Rainbow Trout
RSC	Redside Shiner
SB	Stickleback (General)
SP	Fish Unidentified Species
SU	Sucker (General)
TSB	Threespine Stickleback



- Legend**
- FISS Point
  - Aquatic Site
  - Wildlife Location
  - Flow Direction
  - Drainage Main
  - Parcel
  - Private Lands
  - Project Design Linework
  - Study Area

- Watercourse (Fish Classification) - City of Surrey**
- A
  - AO
  - B
  - C
  - Unknown



**Notes: Fish Classification**

**Class A:** Inhabited by fish year-round or potentially inhabited by fish year round. Considered 'streams' as defined by the Provincial Water Sustainability Act and Riparian Areas Protection Regulation. Considered fish habitat as defined by the Federal Fisheries Act

**Class A(O):** Inhabited by fish primarily during the over-wintering period or potentially inhabited by fish during the over-wintering period with access enhancement. Considered a 'stream' as defined by the Provincial Water Sustainability Act and Riparian Areas Protection Regulation. Considered fish habitat as defined by the Federal Fisheries Act

**Class B:** Provides food/nutrient value to downstream fish habitat. No fish potential present at any time of the year. Considered a 'stream' as defined by the Provincial Water Sustainability Act and Riparian Areas Protection Regulation. Considered fish habitat by the defined by the Federal Fisheries Act

**Class C:** A water feature that is not considered a 'stream' as defined by the Provincial Water Sustainability Act and Riparian Areas Protection Regulation. Not considered fish habitat as defined by the Federal Fisheries Act. No fish potential present at any time of the year.

**References:**  
 Data BC - BC Catalogue  
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 NRCAN Geogratis  
 Open Government License  
 (<http://geogratis.gc.ca/>)



PROJECT:  
 Fraser Surrey Port Lands - Transportation Improvements  
 Preliminary Design Services

TITLE:  
**Project Location and  
 Assessment Area**

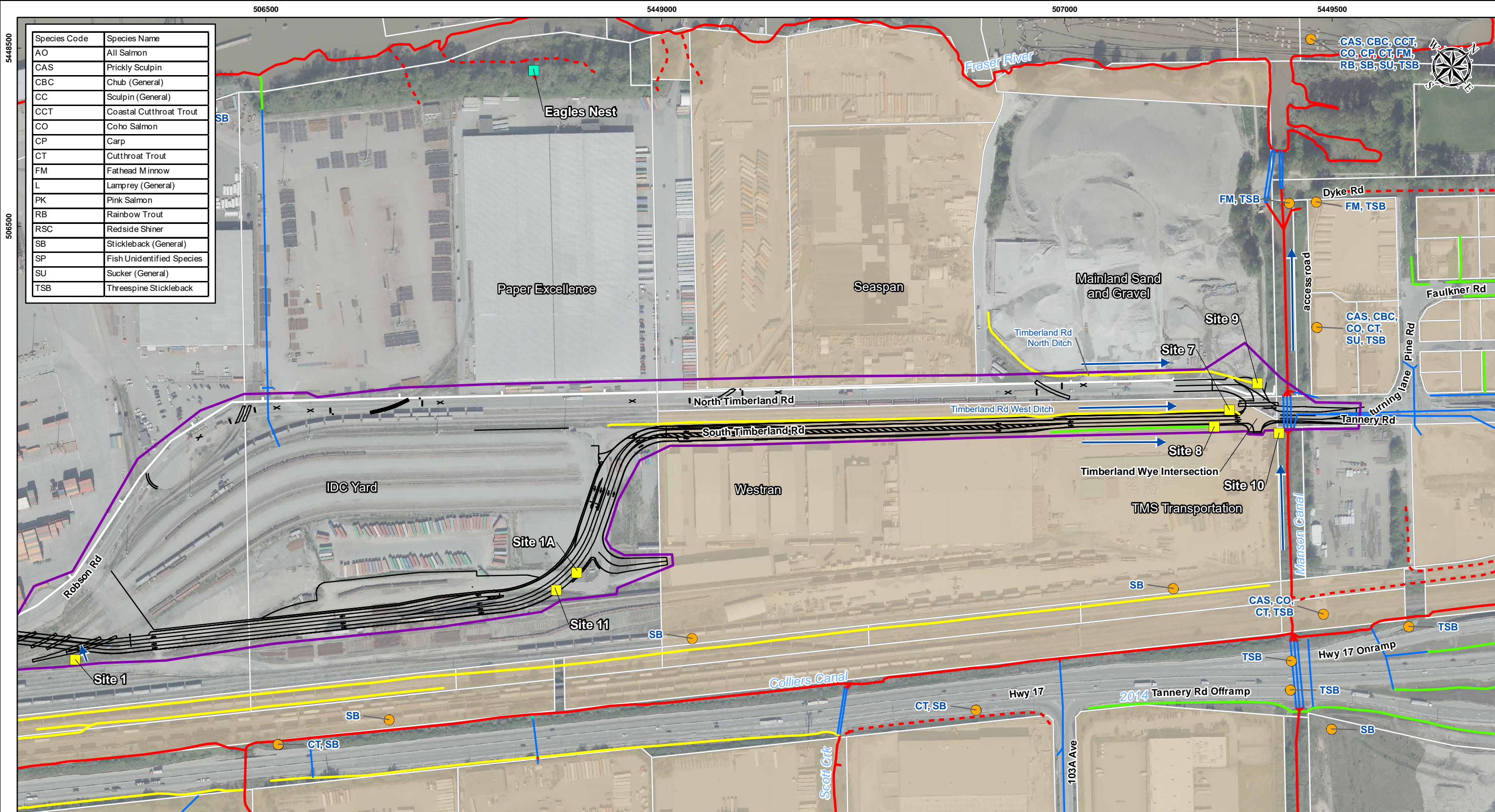
CLIENT:  
 Vancouver Fraser Port Authority

DATE: May 14, 2021  
 ANALYST: MY  
 REVIEWED: RS  
**Figure 4A**

GIS FILE:  
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 PROJECT NO:  
 20M-00758-00  
 COORDINATE SYSTEM:  
 NAD 1983 UTM Zone 10N







Species Code	Species Name
AO	All Salmon
CAS	Prickly Sculpin
CBC	Chub (General)
CC	Sculpin (General)
CCT	Coastal Cutthroat Trout
CO	Coho Salmon
CP	Carp
CT	Cutthroat Trout
FM	Fathead Minnow
L	Lamprey (General)
PK	Pink Salmon
RB	Rainbow Trout
RSC	Redside Shiner
SB	Stickleback (General)
SP	Fish Unidentified Species
SU	Sucker (General)
TSB	Threespine Stickleback

- Legend**
- FISS Point
  - Aquatic Site
  - Wildlife Location
  - Flow Direction
  - Drainage Main
  - ▭ Parcel
  - ▭ Private Lands
  - Project Design Linework
  - ▭ Study Area

**Watercourse (Fish Classification) - City of Surrey**

- A
- - - AO
- B
- C
- Unknown

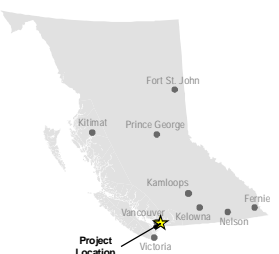
**Notes: Fish Classification**

**Class A:** Inhabited by fish year-round or potentially inhabited by fish year round. Considered 'streams' as defined by the Provincial Water Sustainability Act and Riparian Areas Protection Regulation. Considered fish habitat as defined by the Federal Fisheries Act

**Class B:** Provides food/nutrient value to downstream fish habitat. No fish potential present at any time of the year. Considered a 'stream' as defined by the Provincial Water Sustainability Act and Riparian Areas Protection Regulation. Considered fish habitat by the defined by the Federal Fisheries Act

**Class C:** A water feature that is not considered a 'stream' as defined by the Provincial Water Sustainability Act and Riparian Areas Protection Regulation. Not considered fish habitat as defined by the Federal Fisheries Act. No fish potential present at any time of the year.

**References:**  
 Data BC - BC Catalogue  
 Open Government License  
 (<http://www.data.gov.bc.ca/>)  
 NRCAN Geogratis  
 Open Government License  
 (<http://geogratis.gc.ca/>)



**PROJECT:**  
 Fraser Surrey Port Lands - Transportation Improvements  
 Preliminary Design Services

**TITLE:**  
 Project Location and Assessment Area

**CLIENT:**  
 PORT of vancouver Vancouver Fraser Port Authority

**DATE:** May 14, 2021  
**ANALYST:** MY  
**REVIEWED:** RS

**Figure 4B**

**GIS FILE:**  
 02-01-001\_Assessment\_Area\_v2.mxd

**PROJECT NO:**  
 20M-00758-00

**COORDINATE SYSTEM:**  
 NAD 1983 UTM Zone 10N







# 3 POTENTIAL PROJECT EFFECTS AND MITIGATION MEASURES

## 3.1 PROJECT INTERACTIONS

High-level potential project interactions are summarized in Table 3 below and may include:

- Direct effects to vegetation including several rare / sensitive species;
- Direct and indirect effects to birds;
- Direct and indirect effects to fish and fish habitat; and
- Direct and indirect effects to water quality.

**Table 2 - Project Activities and Potential Effects**

Project Activities	Potential Effect
<ul style="list-style-type: none"><li>– Widening / realignment of existing roads</li><li>– construction of new roads</li></ul>	<ul style="list-style-type: none"><li>– disturbance / removal of terrestrial vegetation, shrubs and trees</li><li>– direct mortality, physical injury or behavioral change to birds due to habitat disturbance or removal of nests</li><li>– direct / indirect effects to listed rare / sensitive vegetation specie</li></ul>
<ul style="list-style-type: none"><li>– Riparian area and instream works</li></ul>	<ul style="list-style-type: none"><li>– decrease in water quality due to sedimentation or mobilization of historical soil contamination</li><li>– disturbance / loss of riparian area or instream freshwater habitat</li><li>– direct mortality, physical injury or behavioral change to fish due to instream works</li></ul>

### 3.1.1 POTENTIAL EFFECTS AND MITIGATION MEASURES

A Construction Environmental Management Plan (CEMP) and various other environmental protection plans will be prepared for the Project. The CEMP will outline how construction of the Project will minimize effects on fish and fish habitat, vegetation and wildlife will be finalized prior to construction. To check compliance with the CEMP and any site-specific environmental protection plans prepared by a contractor, a qualified environmental monitor will observe all construction activities around sensitive habitats. These monitors will have the authority to recommend if, when and where additional mitigation may be necessary and to stop work if prescribed mitigation measures are not being implemented or are being implemented incorrectly.

Numerous BMPs, guidelines, and mitigation measures exist to avoid harming fish, fish habitat, vegetation and wildlife and these include:

- Standards and Best Practices for Instream Works (British Columbia Ministry of Water, Land and Air Protection [BC MWLAP], 2004b);
- A Users Guide to Working In and Around Water (BC MOE, 2009);



- Reduced Risk Instream Work Windows Ministry of Environment, Lower Mainland Region (BC MOE, 2006);
- Measures to Protect Fish and Fish Habitat (DFO, 2019);
- Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia (2013). A Companion Document to Develop with Care 2012. (BC MOE, 2013);
- Guidelines for Amphibians for Reptile Conservation During Road Building and Management Activities in British Columbia Version 1.0. March 30, 2020. (BC Ministry of Environmental and Climate Change Strategy, 2020).
- Guidelines for Amphibian and Reptile Conservation During Urban and Rural Development in British Columbia -2014 (BC MOE, 2014)

Measures included in these guidelines and BMPs are generally effective for avoiding or reducing serious harm to if implemented correctly and adapted as necessary to local site conditions. Section 3.2 provides a summary of potential effects associated with the project and proposed mitigation

**Table 3 - Summary of Potential Effects from project activities and their proposed mitigation**

Component	Potential Effect	Mitigation	Residual Effect
Fish Species of Conservation Concern	Reduced water quality due to increased sediment and erosion. Change in flows downstream Loss of food and nutrients downstream. Increased contaminants into nearby watercourses.	Work within fish timing window (Aug 1 to Oct 31 for Cutthroat Trout). Work in the dry. Pump and isolate ditches. Maintain ESC measures. Operate machinery from top of bank. Ensure machinery/equipment is clean and in good condition.	None anticipated if mitigations measures are properly implemented.
Vegetation Species of Conservation Concern	No anticipated potential effects on SARA listed plant; streambank lupine was not present during the site assessment and suitable habitat for Vancouver Island Beggarticks was not observed. No Loss of other at-risk plant species due to vegetation removal during road widening and construction and continual maintenance during operations is possible	Limit construction to existing footprint. Construction is not anticipated to occur near streambank lupine critical habitat however demarcating (flag) could prevent accidental encroachment. If a plant species of conservation concern is noted during pre-construction or construction, work should be halted and a biologist should be consulted. Terms and conditions will be summarized in the CEMP.	None anticipated if mitigations measures are properly implemented.
Wildlife Species of Conservation Concern	Loss of habitat due to vegetation clearing during construction	Potential for presence of wildlife species of conservation concern determined during site visit. Pre-clearing bird nest surveys and amphibian salvage pre-construction to reduce effects on all wildlife species potentially present.	None anticipated if mitigations measures are properly implemented.

Component	Potential Effect	Mitigation	Residual Effect
	Mortality due to vegetation clearing	Potential for presence of wildlife species of conservation concern determined during site visit. Pre-clearing bird nest surveys and amphibian salvage pre-construction to reduce effects on all wildlife species potentially present.	None anticipated if mitigations measures are properly implemented.
	Sensory disturbance from construction vehicles and increased traffic	Potential for presence of wildlife species of conservation concern determined during site visit. Pre-clearing bird nest surveys and following terms and conditions of CEMP to reduce effects on all wildlife species potentially present. If Bald Eagle nests are active during construction, created a Bald Eagle Management Plan and monitor.	None anticipated if mitigations measures are properly implemented.



## REFERENCES

- BC Ministry of Environment. March 2006. Guidelines for Reduced Risk Instream Work Windows Ministry of Environment, Lower Mainland Region. Available at: <https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-licensing-rights/working-around-water/regional-terms-conditions-timing-windows> Accessed June 2020.
- BC Ministry of Environment, 2006. Guidelines for Reduced Risk Instream Work Windows, Lower Mainland Region. Available at: [https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/working-around-water/work\\_windows\\_low\\_main.pdf](https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/working-around-water/work_windows_low_main.pdf)
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Fisheries and Oceans Canada (DFO). 2019. Measures to protect fish and fish habitat. Available at: [Measures to protect fish and fish habitat \(dfo-mpo.gc.ca\)](https://www.dfo-mpo.gc.ca/species-risk-registry/virtual_sara/files/plans/rs_Northern_Abalone_0907_e.pdf). Accessed January 2021.

Government of Canada. 2019. Explanation for issuing permit (SARA-PYR-2019-0480) pursuant to the provisions of section 73 of SARA - Streambank Lupine Available at: <https://species-registry.canada.ca/index-en.html#/permits/895-3> Accessed June 2020.