TECHNICAL MEMORANDUM

DATE October 1, 2024 **Reference No.** 22525903-008-TM-Rev0

TO Krista Englund, Regional Manager of Environmental Services for SCR
Ministry of Transportation and Infrastructure

CC

FROM John Sherrin, Mark Visser **EMAIL john.sherrin@wsp.com**

MARINE SUBTIDAL HABITAT SURVEY FOR THE FAIRBANKS ROAD FLOOD RESPONSE PROJECT, COWICHAN BAY, BC

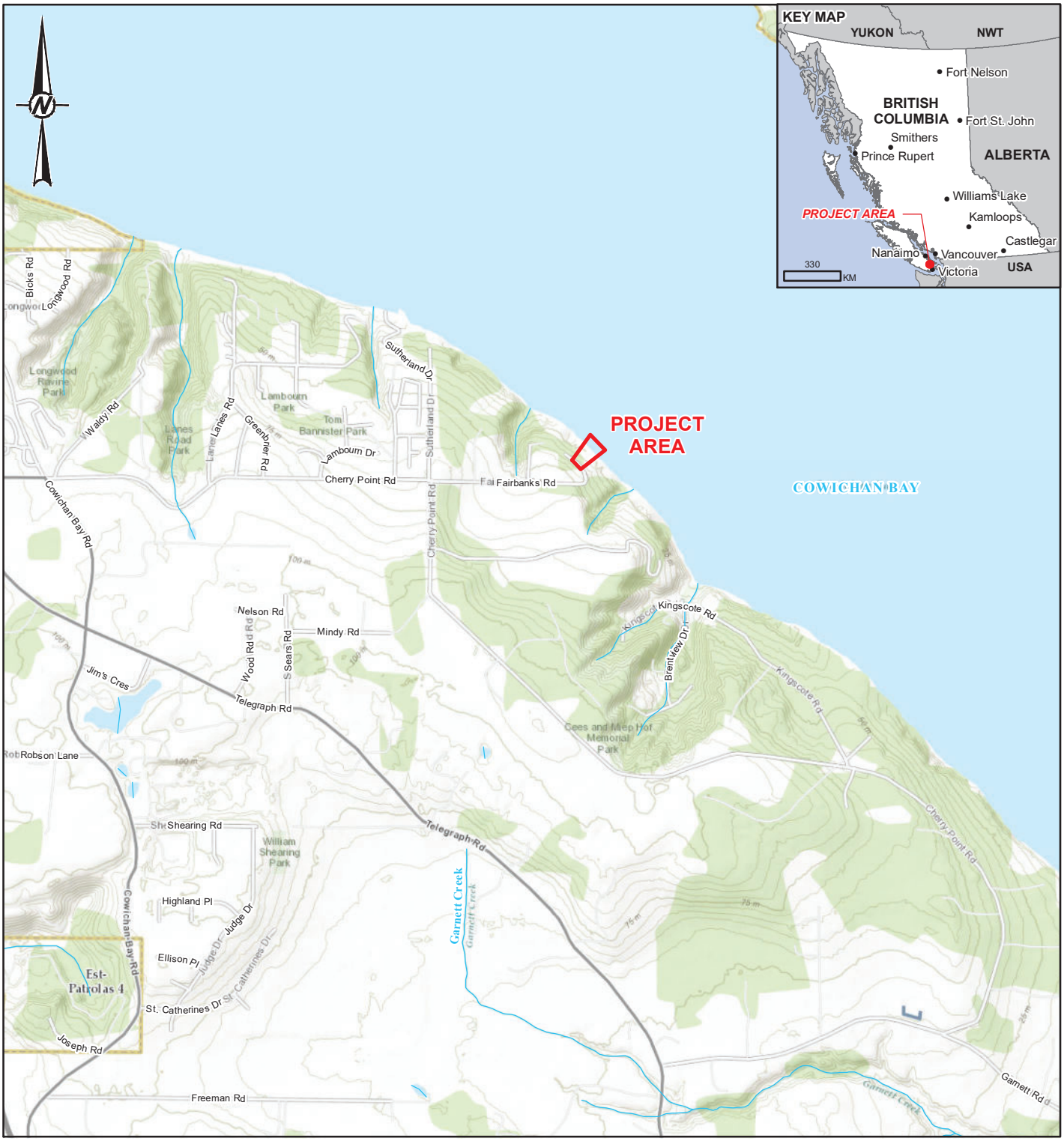
WSP was retained by the British Columbia (BC) Ministry of Transportation and Infrastructure (MoTI) to conduct a marine subtidal habitat survey in support of project planning and permitting requirements for repair and stabilization of a portion of Fairbanks Road and the adjacent bank where a slope failure has occurred (the Project) in Cowichan Bay, BC (the Site; Figure 1). WSP understands that a barge will be required to bring equipment and materials to site during the repair and stabilization activities and that the use of temporary spuds and/or installation of temporary pilings will be required in order to anchor the barge. This technical memorandum summarizes the results of the marine subtidal habitat survey in areas where barge activities for the purpose of loading or offloading materials at the Site may occur.

The scope of work for the marine subtidal habitat survey was completed under works outlined in WSP's change order titled "Change Order for Additional Environmental Services for Fairbanks Road Flood Response, Cowichan Bay, BC", dated 1 August 2023. Approval for the above change order was provided by MoTI on 9 August 2023 under BC MOTI Contract 852CS1885 – As & When Professional Environmental Project Coordination Services executed 15 March 2023.

1.0 OBJECTIVE

Construction of a temporary barge ramp is being considered to facilitate delivery of imported fill and equipment to the Site. The construction of a temporary barge ramp has the potential to affect marine environments adjacent the Site through seafloor and/or shoreline disturbance and, as a result, an assessment of the marine environment is required to support planning and potential permitting requirements under relevant federal legislation.

The objective of the marine subtidal habitat survey was to document and delineate substrate types, marine vegetation (including those important for fish habitat such as understory brown-bladed kelp [laminarian species], canopy-forming kelp, eelgrass [*Zostera marina*]), potential northern abalone [*Haliotis kamtschatkana*] habitat, and occurrences of invertebrates and fishes in subtidal areas where habitat data has not recently been collected to support project planning and anticipated permitting requirements for the proposed construction activities.



LEGEND

- PROJECT AREA
- WATERCOURSE

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REFERENCE(S)

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2. WATERCOURSE AND INSET MAP CONTAINS INFORMATION LICENCED UNDER THE OPEN GOVERNMENT LICENCE – BRITISH COLUMBIA

COORDINATE SYSTEM: NAD 1983 CSRS UTM ZONE 10N

CLIENT
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE

PROJECT
MOTI FAIRBANKS FLOOD RESPONSE – MARINE SUBTIDAL HABITAT SURVEY

TITLE
PROJECT LOCATION

CONSULTANT
wsp

YYYY-MM-DD	2023-09-06
DESIGNED	JS
PREPARED	MH
REVIEWED	KW
APPROVED	RJ

PROJECT NO.	CONTROL	REV.	FIGURE
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2.0 METHODS

The field survey was conducted in general accordance with Fisheries and Oceans Canada's (DFO) Marine Foreshore Environmental Assessment Procedure (MFEAP) (DFO 2003) and consisted of the following components:

- Towed video survey to document substrate types, macroalgae, sessile and motile invertebrates, and record opportunistic observations of fish usage of marine habitats.
- Kelp and/or eelgrass habitat mapping in areas identified as fish habitat with marine vegetation greater than 10% areal cover.
- Habitat features were qualitatively evaluated to support substrate classifications.
- Opportunistic observations, including motile/sessile invertebrates, fishes and debris were recorded during the surveys.

An underwater towed video survey was undertaken by a three-person WSP team aboard WSP's 8-m vessel, 'the Salish GAL' on 23 August 2023. Towed video footage was recorded along the majority of the Site's shallow subtidal shoreline (Figure 2). The survey was conducted using a system consisting of a high-resolution video camera with integrated Wide Area Augmentation System (WAAS)-enabled Global Positioning System (GPS) Garmin 60CXs[1] video overlay. The video system was operated by trained personnel using a real-time monitor set-up on the deck of the vessel. Vessel positioning during the towed video survey was monitored and recorded using on-board Lowrance HDS-12 navigational software.

A total of four shore-perpendicular transects were surveyed between approximately -15 m Chart Datum (CD) and +1.5 m CD with additional shore-parallel transects conducted to map and delineate marine vegetation. The survey vessel was operated at approximately 1 to 2 km/h with the camera suspended approximately 0.3 m to 1 m above the seafloor to allow for suitable visibility of the substrate and vegetation during the surveys. During the towed video surveys qualitative observations of kelp and eelgrass coverage were recorded and the extent of the kelp and eelgrass habitats were mapped. Opportunistic fish sightings and important habitat features were recorded.

The video footage was reviewed in the office by a qualified biologist, familiar with habitat features and species commonly occurring in the Georgia Strait, and observations were georeferenced to waypoints collected during the survey. Results from the towed video survey were used to delineate the perimeter of eelgrass and understory kelp habitat. Areas where <5-10% areal coverage of eelgrass and understory kelp were observed were omitted due to the patchy occurrence of eelgrass and kelp at <5-10% cover and difficulties in determining consistent habitat boundaries in areas with low coverage.

[1] GPS accuracy was approximately +/- 3 m.

457200
457300
457400
5397800
5397700

T1
T2
T3
T4

COWICHAN BAY

PROJECT AREA

Fairbanks Rd

LEGEND

- TOWED VIDEO TRACK
- PROJECT AREA
- WATERCOURSE
- ROAD

0 20 40
1:1,000 METRES

REFERENCE(S)

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COORDINATE SYSTEM: NAD 1983 CSRS UTM ZONE 10N

CLIENT
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE

PROJECT
MOTI FAIRBANKS FLOOD RESPONSE – MARINE SUBTIDAL HABITAT SURVEY

TITLE
TOWED VIDEO SURVEY TRACKS

CONSULTANT

YYYY-MM-DD	2023-09-06
DESIGNED	JS
PREPARED	MH
REVIEWED	KW
APPROVED	RJ

PROJECT NO.	CONTROL	REV.	FIGURE
22573043	8004	0	2

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3.0 RESULTS

The majority of substrates within the subtidal areas were a mix of sand, with scattered gravel, cobble and shell debris (Figure 3). No evidence of bedrock or boulders were observed within the survey area.

A variety of macroalgae were observed in the subtidal areas within the adjacent foreshore to the proposed Project area, including eelgrass and understory kelp species. Eelgrass was observed between 0 m and -2.1 m CD and was generally observed at 50-100% areal coverage throughout the survey area within that depth range (Figure 3; Photo 1). Sugar kelp (*Saccharina latissima*), an understory kelp species, was observed in a few locations at between 10 and 50% areal coverage, co-located with eelgrass, primarily between -1.0 and -2.0 m CD. No understory kelp greater than 10% areal coverage was observed outside of areas where eelgrass was observed and delineated. Other macroalgae species observed included sea lettuce (*Ulva* sp.) at depths between 0 m and +1.5 m CD, and unidentified red foliose and red bladed algae (e.g., *Rhodymenia* sp. and *Chondracanthus* sp.). No evidence of canopy forming kelp or potentially suitable abalone habitat[2] was observed in the surveyed areas.

A few small schools of shiner perch (*Cymatogaster aggregata*) were observed in areas vegetated with eelgrass (Figure 3). Several Dungeness crabs (*Metacarcinus magister*) were observed along with plumose anemones (*Metridium* spp.) attached to gravel and cobble. One harbor seal (*Phoca vitulina*) was observed during the survey as well as a double-crested cormorant (*Nannopterum auritum*).

Photo 1: Eelgrass (*Zostera marina*) and sugar kelp (*Saccharina latissimi*) in the upper subtidal zone, 23 August 2023.

[2] Suitable abalone habitat includes the presence of stable substrates (bedrock, boulder/ riprap) at depths of less than 10 m chart datum (CD); the presence of coralline algae (*Lithothamnion* spp.), which serves a number of functions for northern abalone; and marine vegetation such as understory and canopy-forming kelp, which offers food and cover for adults (DFO 2012).

457200
457300
457400
5397800
5397700

COWICHAN BAY

Fairbanks Rd

LEGEND

- FISH OBSERVATION
- PROJECT AREA
- EELGRASS >10% COVER
- SILT AND SAND
- WATERCOURSE
- ROAD

0 20 40
1:1,000 METRES

REFERENCE(S)

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COORDINATE SYSTEM: NAD 1983 CSRS UTM ZONE 10N

CLIENT
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE

PROJECT
MOTI FAIRBANKS FLOOD RESPONSE – MARINE SUBTIDAL HABITAT SURVEY

TITLE
MARINE SUBTIDAL HABITAT

CONSULTANT

YYYY-MM-DD	2023-09-06
DESIGNED	JS
PREPARED	MH
REVIEWED	KW
APPROVED	RJ

PROJECT NO.	CONTROL	REV.	FIGURE
22573043	8004	0	3

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4.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the marine subtidal habitat survey, the proposed Project activities, including temporary barge ramp installation (i.e., use of a spudded-down barge and/or installation of temporary pilings to convey materials to/from Site), have the potential to affect fish and fish habitat. If spuds, anchors, or pilings are placed on sensitive fish habitat, such as areas vegetated with eelgrass, the habitat could be altered/disturbed/destroyed which could be considered a harmful alteration, disruption, or destruction (HADD) of fish habitat under the *Fisheries Act*. If it is considered a HADD, an authorization and offsetting would be required by DFO. WSP recommends that the use of a spudded-down barge and/or installation of temporary pilings is designed to avoid placement within the 0 to -2.1 m CD bathymetry contour to avoid a HADD. Increased turbidity and/or total suspended solids (TSS) concentrations in the water column generated during construction activities could also result in a disruption of feeding by visual predators such as juvenile salmon (Berg and Northcote 1985) and could cause gill abrasions (Birtwell 1999; Servizi and Martens 1987) and respiratory distress in fish (Berg and Northcote 1985). Depending on the construction activities selected, measures to protect fish habitat from increased sedimentation and physical disturbance would need to be developed and implemented.

It is recommended that mitigation measures be developed to protect areas where fish habitat has been identified and that activities that have the potential to disturb fish habitat (e.g., areas with delineated eelgrass and understory kelp beds), not be permitted prior to receiving the outcome of DFO's review of the Request for Review package.

5.0 CLOSURE

If there are any questions concerning this technical memorandum, please contact the undersigned at 250-418-5595.

WSP Canada Inc.

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Senior Marine Biologist

Mark Visser, BSc, RPBio
Project Manager, Senior Biologist.

Reviewed by:

Rachael Jones, MSc, RPBio
Principal Aquatic Biologist

JS/MV/RJ/lih

https://wsponline.sharepoint.com/sites/gld-163498/project files/6 deliverables/3.0_issued/22525903-008-tm-rev0/22525903-008-tm-rev0-moti fairbanks marine subtidal survey 01oct_24.docx

6.0 REFERENCES

Berg L and Northcote T. 1985. Changes in territorial, gill-flaring and feeding behaviour in juvenile coho salmon (*Oncorhynchus kisutch*) following short-term pulses of suspended sediment. Can. J. Fish Aquat. Sci. 42: 1410-1417.

Birtwell I. 1999. The effects of sediment on fish and their habitat, Fisheries and Oceans Canada, Science Branch, Marine Environment and Habitat Sciences Division, West Vancouver, BC.

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Servizi J and Martens D. 1987. Some effects of suspended Fraser River sediments on sockeye salmon (Oncorhynchus nerka). Can Spec Pub Fish Aquat Sci 96: 254-64