



STAFF REPORT

DATE: January 9, 2026 **FILE:** 0550-04

TO: Chair and Directors
Regional Board

FROM: David Leitch
Chief Administrative Officer

RE: **BYLAW NO. 625 - OYSTER RIVERBANK PROTECTION SERVICE**

PURPOSE/PROBLEM

To consider initiating an alternative approval process for Bylaw No. 625 which proposes to extend the boundaries of the Oyster Riverbank protection service to be align with the boundaries of the Oyster River flood protection service.

EXECUTIVE SUMMARY

The attached report was considered by the Board at its October 22, 2025 meeting at which time Bylaw No. 625 was given first 3 readings and authorized for elector approval via alternative approval process. The approval from the Inspector of Municipalities was subsequently obtained on December 19, 2025.

Before launching the AAP, the Board will need to establish the elector response form to be used, the deadline for elector responses and the total number of electors eligible to participate in the AAP. All of that information will be available to the public as part of the AAP process. It is recommended that the deadline for elector responses be confirmed as 12:00 noon on Monday, March 16, 2026 which will meet all of the statutory requirements for public notification and give sufficient time for submission of elector responses as required by the *Community Charter* and the *Local Government Act*. The attached AAP response form has been constructed on this basis. At the conclusion of the elector response period a further report will be presented to the Board confirming the total number of valid responses and the results of the AAP.

In the event that less than 10% of the electors submit responses to the Regional District prior to the deadline the Board may proceed with adoption of Bylaw No. 625 without further approvals. On the other hand, if at least 10% of the total electors respond in the negative, the Board will only be able to adopt Bylaw No. 625 if an assent voting opportunity is provided and a majority of electors who vote at that opportunity are in favour of the bylaw.

RECOMMENDATIONS

1. THAT the report from the Chief Administrative Officer be received.
2. THAT the total number of electors within the area affected by Bylaw No. 625 be fairly determined to be 704 for purposes of the alternative approval process.
3. THAT the deadline for submission of elector responses in respect of the alternative approval process for Bylaw No. 625 be established as 12:00 noon on Monday, March 16, 2026.

4. THAT the elector response form attached to the January 9, 2025 report from the Chief Administrative Officer be approved for use with the alternative approval process for Bylaw No. 625.

Respectfully:



David Leitch
Chief Administrative Officer

Proposed timetable for consolidating Oyster River services assuming AAP approved.

Schedule	Action
September 3, 2025	Electoral Areas Services Committee reviews report on Oyster River service consolidation and recommends the Board proceed with initiative.
September 17, 2025	Board reviews report on consolidation of Oyster River bank protection and flood protection services and authorizes preparation of bylaws.
October 22, 2025	Board gives first 3 readings to Bylaw No. 625, being Oyster River Bank Protection Amendment and authorizes AAP for obtaining elector approval..
October 29, 2025	Director consent for Bylaw No. 625 obtained pursuant to s.347 <i>Local Government Act</i> .
October 31, 2025	Bylaw No. 625 submitted to Inspector of Municipalities for approval under s.349 of the <i>Local Government Act</i> .
December 23, 2025	Approval for Bylaw No.625 received from Inspector of Municipalities.
January 28, 2026	Board approves elector response form, elector response deadline and number of electors eligible to participate in AAP for Bylaw No. 625.
February 4, 2026	First publication of AAP notice for Bylaw No. 625.
February 11, 2026	Second publication of AAP notice for Bylaw No. 625.
March 16, 2026	Deadline for receipt of elector response forms for AAP.
March 25, 2026	If Bylaw No. 625 approved by electors, Board adopts Bylaw No. 625 and gives first 3 readings to Oyster River Service Merging Bylaw No. [redacted].
March 31, 2026	Oyster River Service Merging Bylaw No. [redacted] submitted to Inspector of Municipalities for approval under s.349 of the <i>Local Government Act</i> .
May 18, 2026	Inspector of Municipalities approval received for Oyster River Service Merging Bylaw No. [redacted].
May 27, 2026	Oyster River Service Merging Bylaw No. [redacted] adopted by the Board.

Prepared by: T. Yates, Senior Corporate Services Manager

Attachment: Bylaw No. 625
Elector Response Form and Calculation of Eligible Electors
Copy of October 15, 2025 report to the Board



BYLAW NO. 625

A BYLAW TO AMEND PROVISIONS OF THE OYSTER RIVER BANK PROTECTION SERVICE WITHIN ELECTORAL AREA D

WHEREAS the former Comox-Strathcona Regional District, by Bylaw No. 221, established a specified area in 1976 within part of Electoral Area D for the purpose of undertaking bank protection improvements for specified properties adjacent to Oyster River;

AND WHEREAS the Comox-Strathcona Regional District, by Bylaw No. 1171, has converted the said specified area to a local service in 1990;

AND WHEREAS the former Comox-Strathcona Regional District was, by Order in Council 059/08, divided into the Comox Valley Regional District and the Strathcona Regional District on February 15, 2008;

AND WHEREAS a service of the former Comox-Strathcona Regional District that was operated within all or part of the area comprising the Strathcona Regional District remains in force as a service of the Strathcona Regional District until amended or repealed;

AND WHEREAS the Oyster River Bank Protection local service area is located within Electoral Area D of the Strathcona Regional District;

AND WHEREAS the Regional Board wishes to amend the Oyster River Bank Protection service as set forth in this bylaw;

AND WHEREAS approval of the electors has been obtained pursuant to the s.342 of the *Local Government Act*;

NOW THEREFORE the Board of Directors of the Strathcona Regional District, in open meeting assembled, enacts as follows:

Amendments

1. (1) The boundaries of the service as shown in Bylaw No. 1171 are hereby amended to include all that area shown outlined in bold on Appendix 'A', attached to and forming part of this bylaw.

(2) The name of the service shall be known hereinafter as the Oyster Riverbank protection service.

Participating Area

2. The participating area for the service is Electoral Area D (Oyster Bay-Buttle Lake).

Citation

3. This bylaw may be cited for all purposes as Bylaw No. 625, being Oyster River Bank Protection Local Service Establishment Bylaw 1989, Amendment No.1.

READ A FIRST TIME ON THE 22ND DAY OF OCTOBER, 2025

READ A SECOND TIME ON THE 22ND DAY OF OCTOBER, 2025

READ A THIRD TIME ON THE 19TH DAY OF NOVEMBER, 2025

APPROVED BY THE INSPECTOR OF MUNICIPALITIES ON THE 19TH DAY OF DECEMBER, 2025

APPROVAL OF THE ELECTORS RECEIVED ON THE DAY OF ,2026

RECONSIDERED, FINALLY PASSED AND ADOPTED ON THE DAY OF , 2026

Chair

Corporate Officer

APPENDIX 'A'



Oyster Riverbank Protection Bylaw No. 625

Determination of Total Number of Electors for Purposes of an Alternate Approval Process

- Purpose:** To make a fair determination of the total number of electors within the area affected by Bylaw No. 625, being Oyster River Bank Protection Local Service Establishment Bylaw 1989, Amendment No.1. An elector is defined as a person who would qualify to vote on the question of approving Bylaw No. 625 if such a vote was to be held on the date this report was prepared.
- Area Affected:** The area affected by Bylaw No. 625 is the 200-year floodplain of the Oyster River within the southern part of Electoral Area D lying roughly between Oyster River on the south, Iron River Road on the north, the Strait of Georgia on the east and the 15 metre ASL* contour interval on the west. This is the same boundary that is used for the Oyster River Flood Protection service.
- *Note: above sea level
- Approval Process:** The Regional District intends to proceed with an alternative approval process to determine whether Bylaw No. 625 may be adopted without first obtaining the assent of the electors by voting. Should it be determined that less than ten percent of the eligible electors within the affected area file a written objection to Bylaw No. 625 prior to the deadline for responses, the Regional Board may proceed to adoption without the requirement to obtain elector assent by voting in accordance with the provisions¹ of the *Local Government Act*. In the event that ten percent or more of eligible electors object to adoption of Bylaw No. 625 prior to the response deadline, the bylaw may only be adopted if approved by electors through an assent voting process.
- Authority:** The use of an alternative approval process for obtaining the approval of the electors for Bylaw No. 625 is authorized by section 345 of the *Local Government Act*.
- Elector Eligibility:** For the purposes of this report the criteria used for determining the eligibility of persons to vote as electors is based on Part 4 [*Assent Voting*] of the *Local Government Act* of British Columbia. That statute defines electors to include persons who meet the following criteria:
- Canadian citizen
 - 18 years of age or older
 - resident of British Columbia for the last 6 months
 - resident of the voting jurisdiction for the last 30 days or owner of real property within the voting jurisdiction for at least 30 days
 - not otherwise disqualified from voting

Corporate entities are not permitted to qualify as electors in British Columbia.

Methodology:

This report will attempt to make a fair determination of the total number of electors within the area affected by Bylaw No. 625. The number of electors will be the total of those persons who qualify to vote as resident electors and those who qualify to vote as non-resident property electors. Since the methodologies for determining the total number of each type of elector differ significantly, they will need to be determined separately with the results of those calculations aggregated for the purposes of this report.

Resident Electors

Both the Federal and Provincial election authorities maintain lists of registered voters but the databases are not aligned with local government jurisdictional boundaries and are therefore not particularly useful for purposes of this report. Since there is no reliable information available using existing voter enumeration data, it is necessary to consider using other data for the purpose of preparing an estimate of eligible electors.

BC Stats and Elections BC are public agencies which maintain comprehensive databases of population, population distribution, voter eligibility, voter participation rates and other demographics. The following data are supplied by those agencies:

Demographic	Estimate	Source
Population of British Columbia	5,683,201	BC Stats (October 1, 2025)
Population of Strathcona Regional District	48,150	Municipal Affairs (November 1, 2022)
Population of Electoral Area D	4,153	Municipal Affairs (November 1, 2022)
Provincial electors in British Columbia	3,609,288	Elections BC (October 19, 2024)
Civic address points in Electoral Area D	2,023	Regional District GIS (January 20, 2026)
Civic address points in proposed riverbank protection service area	470	Regional District GIS (January 20, 2026)

Using the above data, it can be determined that approximately 63.5% of the population of British Columbia would likely qualify as provincial electors. Notwithstanding minor variations in regional demographics it is believed that this ratio would be sufficiently accurate for estimating the number of provincial electors within Electoral Area D. Since the majority of qualifications required for voting in provincial elections are the same as those required for voting as a resident in local elections, the application of this ratio should provide a reasonable estimate of the number of resident electors within Electoral Area D of the Regional District. Therefore, multiplying the above percentage against the 4,153 population estimate provided by the Ministry of Municipal Affairs yields a total of 2,638

eligible provincial electors resident in Electoral Area D. Since the proposed service area encompassed by Bylaw No. 625 includes only a part of Electoral Area D it is necessary to extrapolate the percentage of the population that resides within the service area. It is proposed that this be calculated by comparing the number of civic addresses in the area to the total civic address count for Electoral Area D. The calculation below illustrates the results of that exercise.

$$\begin{aligned} & \frac{470 \text{ (civic address in proposed service area)}}{2,023 \text{ (civic addresses within Electoral Area D)}} \\ & \times 4,153 \text{ (population of Electoral Area D)} \\ & = 965 \text{ (population of proposed riverbank protection area)} \end{aligned}$$

The calculations for resident electors within the part of Electoral Area D affected by Bylaw No. 625 may therefore be summarized as follows:

$$\begin{aligned} \text{Step 1:} & \quad 3,609,288 \text{ (eligible provincial electors)} \\ & \quad \div 5,683,201 \text{ (total population of B.C.)} \\ & \quad = 63.5\% \text{ (B.C. average \% of electors)} \\ \\ \text{Step 2:} & \quad 48,150 \text{ (Regional District population)} \\ & \quad \times 63.5\% \text{ (B.C. average \% of electors)} \\ & \quad = 30,575 \text{ (Regional District resident electors)} \\ \\ \text{Step 3:} & \quad 30,575 \text{ (Regional District resident electors)} \\ & \quad \times 8.6\% \text{ (\% of Regional District electors in Electoral Area D)} \\ & \quad = 2,629 \text{ (Electoral Area D resident electors)} \\ \\ \text{Step 4:} & \quad 2,629 \text{ (Electoral Area D resident electors)} \\ & \quad \times 23.2\% \text{ (\% of electors in proposed service area)} \\ & \quad = 611 \text{ (resident electors in proposed service area)} \end{aligned}$$

It is concluded that a fair estimate of the number of resident electors within the area affected by Bylaw No. 625, based on the above noted data is 611.

Non-Resident Property Electors

Unlike Provincial elections in British Columbia, persons who do not reside within the local voting jurisdiction may qualify to vote in local elections solely on the basis of property ownership³. These non-resident property electors (NRPE's) must be qualified in all other respects (ie. Canadian citizen, 18 years of age or older, resident of BC, etc.) before they may be considered eligible electors. It is important to reiterate that persons who qualify as resident electors within a voting jurisdiction cannot also qualify as non-resident property electors for the same voting jurisdiction.

The following table contains statistics that will be useful for preparing an estimate of the non-resident property electors within the proposed boundaries of the Oyster Riverbank protection area.

Demographic	Count	Source
Total properties within proposed flood protection service area	407	BC Assessment Authority (January 2, 2026)
Total registered owners within proposed flood protection service area	605	
Registered owners resident within proposed flood protection area	477	
Registered owners resident outside of British Columbia	8	

In order to estimate the number of NRPE’s within the boundaries of the proposed service area for the riverbank protection area, the database of the BC Assessment Authority was queried and it was determined that there are 407 separate properties within the service area and 605 registered property owners.

From this total of 605 potential NRPE’s the following were eliminated in order:

- 477 owners of property resident within the proposed service area;
- 8 owners of property being non-residents of British Columbia;
- 23 owners being corporate entities; and
- 4 properties owned by the Crown (Federal or Provincial).

It was therefore concluded that a reasonable estimate of the number of persons who could qualify to vote as non-resident property electors within the proposed service area for the Oyster River flood protection service, based on the most recently available data, is 93. In arriving at this estimate it is worth noting that voting requirements related to age or citizenship of property owners have not been addressed since there is no data available to the Regional District upon which to evaluate this demographic.

Summary: The total number of eligible electors within the proposed Oyster River Bank Protection service area has been fairly determined to include 611 resident electors and 93 non-resident property electors for a total of 704.

Conclusion: For the purpose of the alternative approval process for Bylaw No. 625, being Oyster River Bank Protection Local Service Establishment Bylaw 1989, Amendment No.1, the total number of eligible electors has been fairly determined to be 704. The number of valid elector responses that are required to withhold approval for the adoption of Bylaw No. 625 without first obtaining elector assent by voting is therefore 71.

- References:
1. S.86 *Community Charter* and s.342 *Local Government Act*
 2. S.65(1)(d) *Local Government Act*
 3. S.66 *Local Government Act*



ELECTOR RESPONSE FORM
Bylaw No. 625, being Oyster River Bank Protection
Local Service Establishment Bylaw 1989,
Amendment No.1

I, the undersigned, being a duly qualified elector of the proposed Oyster River Bank protection service area, am **opposed to** the adoption of Bylaw No. 625, being Oyster River Bank Protection Local Service Establishment Bylaw 1989, Amendment No.1, by the Regional Board of the Strathcona Regional District without first obtaining the assent of the electors by voting, and

By affixing my signature below, I hereby certify that:

- I am eighteen years of age or older;
- I am a Canadian citizen;
- I have resided in British Columbia for at least the last six months;
- I am a resident of the proposed Oyster River Bank protection service area **OR** have been a registered owner of real property within the above area for at least the last 30 days;
- I am not disqualified by law from voting in local elections; and
- I am entitled to sign this elector response form and have not previously signed an elector response form in relation to Bylaw No. 625.

ELECTOR'S FULL NAME (please print legibly including first, last and middle names)
RESIDENTIAL ADDRESS
MAILING ADDRESS (if different than residential address)
CHOOSE ONE:
<input type="checkbox"/> I am a resident elector within the proposed Oyster River Bank protection service area.
<input type="checkbox"/> I am not a resident elector within the proposed Oyster River Bank protection service area but own real property within the proposed Oyster River Bank protection service area that is legally described as follows: _____ _____
SIGNATURE OF ELECTOR

See the reverse side of this form for further information regarding the alternative approval process.



ELECTOR RESPONSE FORM
Bylaw No. 625, being Oyster River Bank Protection
Local Service Establishment Bylaw 1989,
Amendment No.1

The Board of directors for the Strathcona Regional District is seeking to obtain the approval of the electors by alternative approval process for Bylaw No. 625, being Oyster River Bank Protection Service Establishment Bylaw 1989, Amendment No.1. If adopted, Bylaw No. 625 would expand the boundaries of the riverbank protection area to match those used for the Oyster River flood protection service.

INSTRUCTIONS

1. If you qualify as an elector for the proposed Oyster River Bank protection service area and are opposed to the adoption of Bylaw No. 625 you can sign and submit an elector response form.
2. If you are **NOT opposed** to the adoption of Bylaw No. 625 you need not do anything.
3. To submit an elector response form you must qualify as a resident elector or a non-resident property elector for the proposed Oyster River Bank protection service area.

[Note: Only one non-resident property elector may submit an elector response form per property regardless of the number of owners for that property. If a property is owned by more than one person the elector appointed by a majority of the owners must complete and submit an authorization form on behalf of the property. Please refer to Page 3 of this form.]

4. Only one elector per elector response form is permitted.
-

1.

Elector response forms must be received by the Regional District not later than 12:00 noon on Monday, March 16, 2026.

Emailed or faxed elector response forms cannot be accepted; response forms **must** contain original signatures.

2.

The total number of electors in the proposed Oyster River Bank protection service area has been fairly determined to be 704. Unless at least 10% of those electors submit an elector response form to oppose the adoption of Bylaw No. 625 before the deadline the Regional District may adopt the bylaw without first obtaining the assent of the electors by voting.

3.

For further information please contact:

Thomas Yates
Corporate Officer
Strathcona Regional District
990 Cedar Street
Campbell River, BC
V9W 7Z8
250-830-6700
corporate@srd.ca

**NON-RESIDENT PROPERTY ELECTOR
AUTHORIZATION TO SUBMIT A RESPONSE FORM*
Bylaw No. 625, Oyster Riverbank Protection Service**

*To be used only for property having multiple owners.

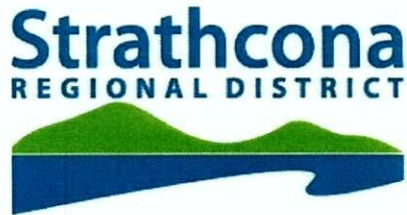
APPOINTMENT AND CONSENT	
We the undersigned persons, together with the person named as our appointee, constitute a majority of registered owners of the real property described below and we hereby appoint that person and give consent for them to act as the designated non-resident property elector for the purposes of this alternative approval process.	

NAME AND ADDRESS OF APPOINTEE	
LAST NAME	FIRST NAME(S)
RESIDENTIAL ADDRESS	
CITY/TOWN	POSTAL CODE
B.C.	

PROPERTY DESCRIPTION	
LEGAL DESCRIPTION	CIVIC ADDRESS (if applicable)
or	

OWNER SIGNATURES		
1. _____ (PRINT NAME)	_____ (SIGNATURE)	_____ (DATE)
2. _____ (PRINT NAME)	_____ (SIGNATURE)	_____ (DATE)
3. _____ (PRINT NAME)	_____ (SIGNATURE)	_____ (DATE)
4. _____ (PRINT NAME)	_____ (SIGNATURE)	_____ (DATE)
5. _____ (PRINT NAME)	_____ (SIGNATURE)	_____ (DATE)
6. _____ (PRINT NAME)	_____ (SIGNATURE)	_____ (DATE)

- Note:
- If more than one person owns the above property the person wishing to submit a response form for that property must provide, at the time of submission, written consent from a majority of the property owners.
 - The person appointed as the non-resident property elector must be one of the registered owners of the property.
 - The only persons who are registered owners of the real property, either as joint tenants or tenants in common, are individuals who are not holding the property in trust for a corporation or another trust.
 - A non-resident property elector may not submit more than one response form regardless of the number of properties owned.



STAFF REPORT

DATE: October 15, 2025 **FILE:** 0550-04 EASC

TO: Chair and Directors
Regional Board

FROM: David Leitch
Chief Administrative Officer

RE: BYLAW NO. 625 - OYSTER RIVERBANK PROTECTION SERVICE

PURPOSE/PROBLEM

To consider Bylaw No. 625 which proposes to extend the boundaries of the Oyster Riverbank protection service to align with the boundaries of the Oyster River flood protection service.

EXECUTIVE SUMMARY

The attached report was considered by the Electoral Areas Services Committee at its October 8, 2025 meeting at which time the following resolution was passed:

Rice/Mawhinney: EASC 248/25

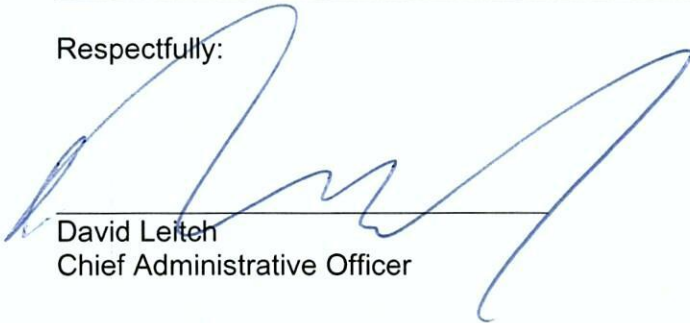
THAT the Committee recommend that Bylaw No. 625 be submitted for approval of the electors using an alternative approval process.

Based on the process approved by the Board, the attached Bylaw No. 625 proposes to align the boundaries of the Oyster Riverbank protection service with those of the Oyster River flood protection service. Bylaw No. 625 will likely require the approval of the electors prior to adoption and the Committee is recommending that this be sought using an alternative approval process (AAP). Once Bylaw No. 625 has been adopted and that boundary alignment is completed, the Board should be able to merge the 2 services by passage of a further bylaw.

RECOMMENDATIONS

1. THAT the report from the Chief Administrative Officer be received.
2. THAT Bylaw No. 625, being a bylaw to amend provisions of the Oyster River bank protection service within Electoral Area D, be now introduced and read a first time.
3. THAT the rules be suspended and Bylaw No. 625 be given second and third readings.
4. THAT elector approval of Bylaw No. 625 be authorized to be obtained using an alternative approval process.
5. THAT Bylaw No. 625 be returned for further consideration by the Board following approval by the Inspector of Municipalities.

Respectfully:



David Leitch
Chief Administrative Officer

Proposed timetable for consolidating Oyster River services assuming AAP approved.

Schedule	Action
September 3, 2025	Electoral Areas Services Committee reviews report on Oyster River service consolidation and recommends the Board proceed with initiative.
September 17, 2025	Board reviews report on consolidation of Oyster River bank protection and flood protection services and authorizes preparation of bylaws.
October 22, 2025	Board gives first 3 readings to Bylaw No. 625, being Oyster River Bank Protection Amendment and authorizes AAP for obtaining elector approval..
October 29, 2025	Director consent for Bylaw No. 625 obtained pursuant to s.347 <i>Local Government Act</i> .
October 31, 2025	Bylaw No. 625 submitted to Inspector of Municipalities for approval under s.349 of the <i>Local Government Act</i> .
December 17, 2025	Approval for Bylaw No.625 received from Inspector of Municipalities.
January 28, 2026	Board approves elector response form, response deadline and number of electors eligible to participate in AAP for Bylaw No. 625.
February 4, 2026	First publication of AAP notice for Bylaw No. 625.
February 11, 2026	Second publication of AAP notice for Bylaw No. 625.
March 16, 2026	Deadline for receipt of elector response forms for AAP.
March 25, 2026	If Bylaw No. 625 approved by electors, Board adopts Bylaw No. 625 and gives first 3 readings to Oyster River Service Merging Bylaw No. [redacted].
March 31, 2026	Oyster River Service Merging Bylaw No. [redacted] submitted to Inspector of Municipalities for approval under s.349 of the <i>Local Government Act</i> .
May 18, 2026	Inspector of Municipalities approval received for Oyster River Service Merging Bylaw No. [redacted].
May 27, 2026	Oyster River Service Merging Bylaw No. [redacted] adopted by the Board.

Prepared by: T. Yates, Senior Corporate Services Manager

Attachment: Bylaw No. 625
Copy of September 29, 2025 report to the EASC



BYLAW NO. 625

A BYLAW TO AMEND PROVISIONS OF THE OYSTER RIVER BANK PROTECTION SERVICE WITHIN ELECTORAL AREA D

WHEREAS the former Comox-Strathcona Regional District, by Bylaw No. 221, established a specified area in 1976 within part of Electoral Area D for the purpose of undertaking bank protection improvements for specified properties adjacent to Oyster River;

AND WHEREAS the Comox-Strathcona Regional District, by Bylaw No. 1171, has converted the said specified area to a local service in 1990;

AND WHEREAS the former Comox-Strathcona Regional District was, by Order in Council 059/08, divided into the Comox Valley Regional District and the Strathcona Regional District on February 15, 2008;

AND WHEREAS a service of the former Comox-Strathcona Regional District that was operated within all or part of the area comprising the Strathcona Regional District remains in force as a service of the Strathcona Regional District until amended or repealed;

AND WHEREAS the Oyster River Bank Protection local service area is located within Electoral Area D of the Strathcona Regional District;

AND WHEREAS the Regional Board wishes to amend the Oyster River Bank Protection service as set forth in this bylaw;

AND WHEREAS approval of the electors has been obtained pursuant to the s.342 of the *Local Government Act*;

NOW THEREFORE the Board of Directors of the Strathcona Regional District, in open meeting assembled, enacts as follows:

Amendments

1. (1) The boundaries of the service are hereby amended to include all that area shown outlined in bold on Appendix 'A', attached to and forming part of this bylaw.

(2) The name of the service shall be known hereinafter as the Oyster Riverbank protection service.

Participating Area

2. The participating area for the service is Electoral Area D (Oyster Bay-Buttle Lake).

Citation

3. This bylaw may be cited for all purposes as Bylaw No. 625, being Oyster River Bank Protection Local Service Establishment Bylaw 1989, Amendment No.1.

READ A FIRST TIME ON THE DAY OF , 2025

READ A SECOND TIME ON THE DAY OF , 2025

READ A THIRD TIME ON THE DAY OF , 2025

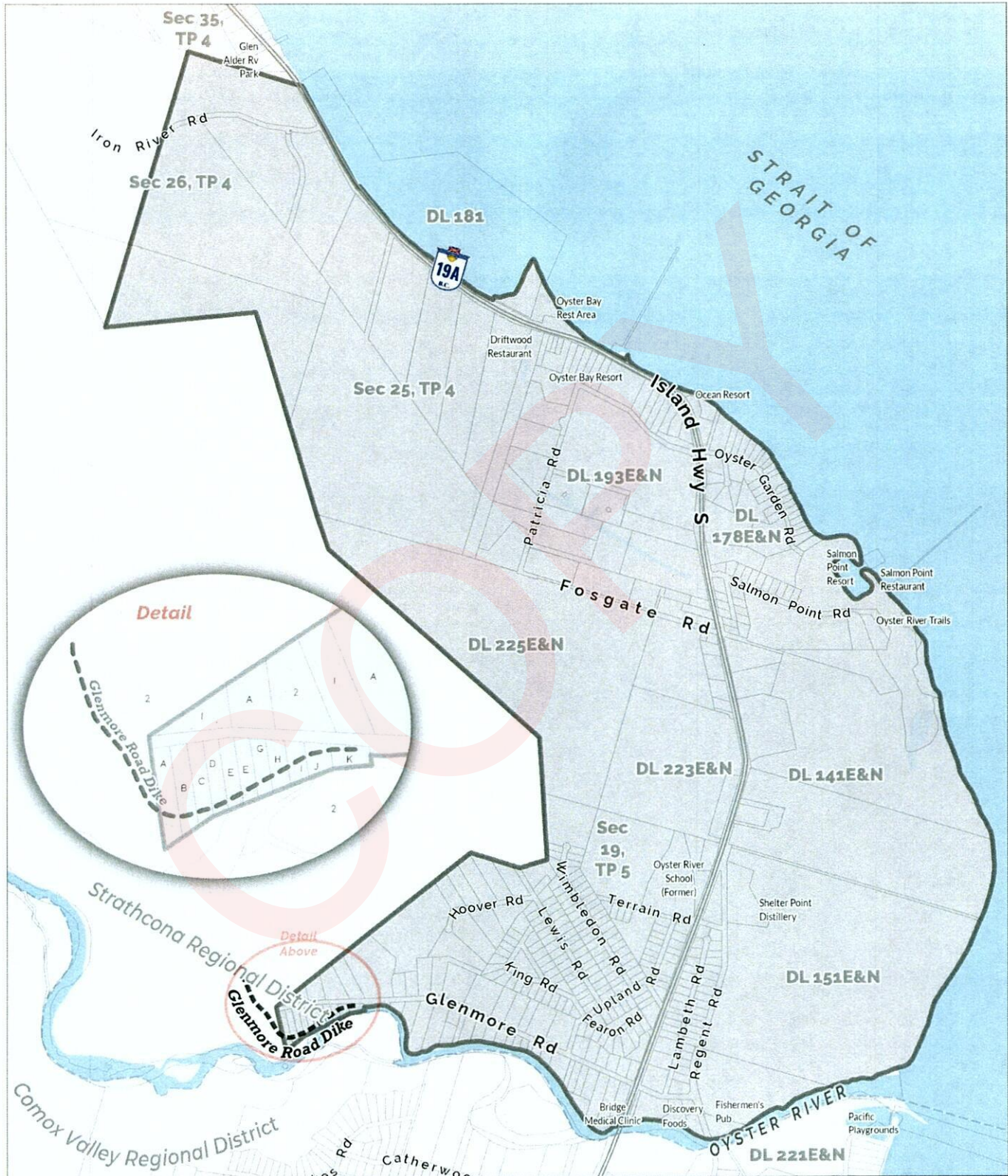
APPROVED BY THE INSPECTOR OF MUNICIPALITIES ON THE DAY OF , 2025

RECONSIDERED, FINALLY PASSED AND ADOPTED ON THE DAY OF , 2025

Chair

Corporate Officer

APPENDIX 'A'





STAFF REPORT

DATE: September 29, 2025 **FILE:** 0550-04 EASC

TO: Chair and Directors
Electoral Areas Services Committee

FROM: David Leitch
Chief Administrative Officer

RE: OYSTER RIVERBANK PROTECTION AND FLOOD PROTECTION SERVICES

PURPOSE/PROBLEM

To consider the attached Bylaw No. 625 which proposes to extend the boundaries of the Oyster Riverbank protection service to align with the boundaries of the Oyster River flood protection service.

EXECUTIVE SUMMARY

The attached report was considered by the Board at its September 17, 2025 meeting at which time the following resolution was passed:

Browne/Colborne: SRD 767/25

THAT the boundaries of the Oyster River Riverbank Protection Service be expanded to align with the boundaries of the Oyster River Flood Protection Service.

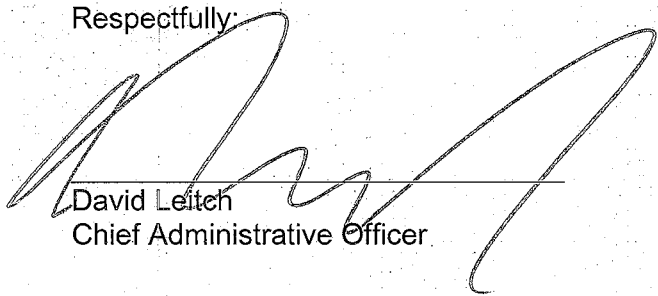
Based on the process approved by the Board, the first step in the process of boundary alignment would be to extend the boundaries of the riverbank protection service to align with those of the flood protection service. That step will require that the attached Bylaw No. 625 be adopted by the Board and it is anticipated that the Ministry of Municipal Affairs will first require approval by the electors. That approval may be sought using an assent voting process or an alternative approval process (AAP). Due to cost and other considerations, it is recommended that an AAP would be the referred method for seeking elector approval.

Once Bylaw No. 625 has been adopted the Board will be able to merge the 2 services by bylaw which may also require that elector approval first be obtained depending on the funding levels proposed by the Board.

RECOMMENDATIONS

1. THAT the report from the Chief Administrative Officer be received.
2. THAT the Committee recommend that Bylaw No. 625 be submitted for approval of the electors using an alternative approval process.

Respectfully:



David Leitch
Chief Administrative Officer

Prepared by: T. Yates, Senior Corporate Services Manager

Attachment: Copy of September 10, 2025 report to the Board

Proposed timetable for consolidating Oyster River services assuming AAP approved.

Schedule	Action
September 3, 2025	Electoral Areas Services Committee reviews report on Oyster River service consolidation and recommends the Board proceed with initiative.
September 17, 2025	Board reviews report on consolidation of Oyster River bank protection and flood protection services and authorizes preparation of bylaws.
October 22, 2025	Board gives first 3 readings to Oyster River Bank Protection, Amendment Bylaw No. 625 and authorized AAP.
October 29, 2025	Director consent for Bylaw No. 625 obtained pursuant to s.347 <i>Local Government Act</i> .
October 31, 2025	Bylaw No. 625 submitted to Inspector of Municipalities for approval under s.349 of the <i>Local Government Act</i> .
December 17, 2025	Approval received for Bylaw No.625 from Inspector of Municipalities.
January 28, 2026	Board approves elector response form, response deadline and number of electors eligible to participate in AAP for Bylaw No. 625.
February 4, 2026	First publication of AAP notice for Bylaw No. 625.
February 11, 2026	Second publication of AAP notice for Bylaw No. 625.
March 16, 2026	Deadline for receipt of elector response forms for AAP.
March 25, 2026	If Bylaw No. 625 approved by electors, Board adopts Bylaw No. 625 and gives first 3 readings to Oyster River Service Merging Bylaw No. <input type="checkbox"/> .
March 31, 2026	Oyster River Service Merging Bylaw No. <input type="checkbox"/> submitted to Inspector of Municipalities for approval under s.349 of the <i>Local Government Act</i> .
May 18, 2026	Inspector of Municipalities approval received for Oyster River Service Merging Bylaw No. <input type="checkbox"/> .
May 27, 2026	Oyster River Service Merging Bylaw No. <input type="checkbox"/> adopted by the Board.



BYLAW NO. 625

A BYLAW TO AMEND PROVISIONS OF THE OYSTER RIVER BANK PROTECTION SERVICE WITHIN ELECTORAL AREA D

WHEREAS the former Comox-Strathcona Regional District, by Bylaw No. 221, established a specified area in 1976 within part of Electoral Area D for the purpose of undertaking bank protection improvements for specified properties adjacent to Oyster River within Electoral Area D;

AND WHEREAS the Comox-Strathcona Regional District, by Bylaw No. 1171, has converted the said specified area to a local service in 1990;

AND WHEREAS the former Comox-Strathcona Regional District was, by Order in Council 059/08, divided into the Comox Valley Regional District and the Strathcona Regional District on February 15, 2008;

AND WHEREAS a service of the former Comox-Strathcona Regional District that was operated within all or part of the area comprising the Strathcona Regional District remains in force as a service of the Strathcona Regional District until amended or repealed;

AND WHEREAS the Oyster River Bank Protection local service area is located within Electoral Area D of the Strathcona Regional District;

AND WHEREAS the Regional Board wishes to amend the Oyster River Bank Protection service as set forth in this bylaw;

AND WHEREAS approval of the electors has been obtained pursuant to the s.342 of the *Local Government Act*;

NOW THEREFORE the Board of Directors of the Strathcona Regional District, in open meeting assembled, enacts as follows:

Amendments

1. (1) The boundaries of the service are hereby amended to include all that area shown outlined in bold on Appendix 'A', attached to and forming part of this bylaw.

(2) The name of the service shall be known hereinafter as the Oyster Riverbank protection service.

Participating Area

2. The participating area for the service is Electoral Area D (Oyster Bay-Buttle Lake).

Citation

3. This bylaw may be cited for all purposes as Bylaw No. 625, being Oyster River Bank Protection Local Service Establishment Bylaw 1989, Amendment No.1.

READ A FIRST TIME ON THE DAY OF , 2025

READ A SECOND TIME ON THE DAY OF , 2025

READ A THIRD TIME ON THE DAY OF , 2025

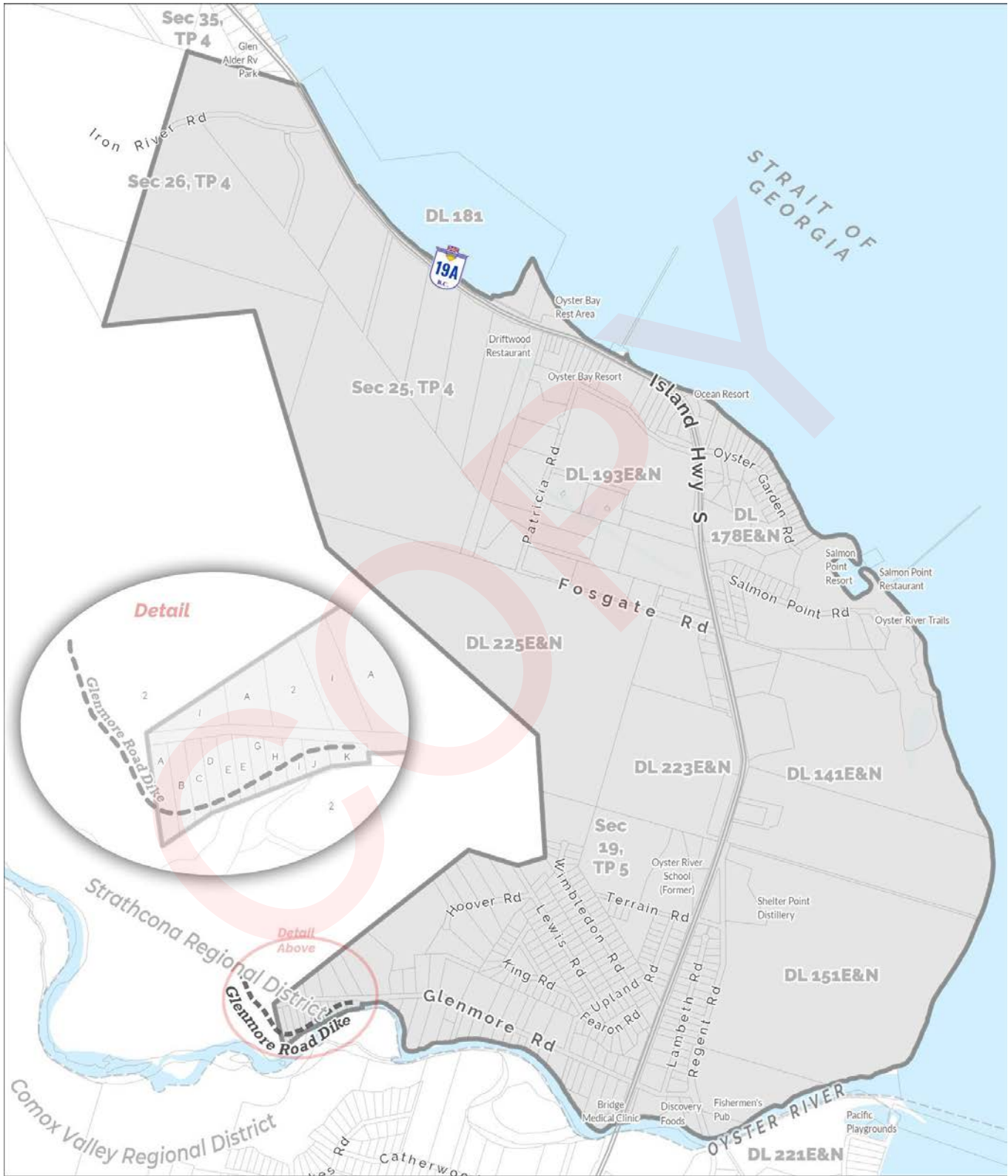
APPROVED BY THE INSPECTOR OF MUNICIPALITIES ON THE DAY OF , 2025

RECONSIDERED, FINALLY PASSED AND ADOPTED ON THE DAY OF , 2025

Chair

Corporate Officer

APPENDIX 'A'





STAFF REPORT

DATE: September 10, 2025

FILE: 0550-04 Board

TO: Chair and Directors
Regional Board

FROM: David Leitch
Chief Administrative Officer

RE: OYSTER RIVERBANK PROTECTION AND FLOOD PROTECTION SERVICES

PURPOSE/PROBLEM

To consider a recommendation from the Electoral Areas Services Committee to consolidate the Oyster Riverbank protection service and the Oyster River flood protection service into a single service.

EXECUTIVE SUMMARY

At the August 20, 2025 meeting of the Electoral Areas Services Committee the attached report was considered and the following resolution was passed:

Rice/Mawhinney: EASC 219/25

THAT the Regional District expand the boundaries of the riverbank protection service to reflect the same boundaries as the flood protection service

The following actions are offered in support of the Committee's recommendation.

RECOMMENDATIONS

1. THAT the report from the Chief Administrative Officer be received.
2. THAT the boundaries of the Oyster River Riverbank Protection Service be expanded to align with the boundaries of the Oyster River Flood Protection Service.

Respectfully:



David Leitch
Chief Administrative Officer

Prepared by: E. Watson, Manager, Corporate Operations

Attachments: August 29, 2025 report to the Electoral Areas Services Committee



STAFF REPORT

DATE: August 29, 2025 **FILE:** 0550-04 Board

TO: Chair and Directors
Electoral Areas Services Committee

FROM: David Leitch
Chief Administrative Officer

RE: OSTER RIVERBANK PROTECTION AND FLOOD PROTECTION SERVICES

PURPOSE/PROBLEM

To consider the benefit and process for consolidating the Oyster Riverbank protection service and the Oyster River flood protection service into a single service.

EXECUTIVE SUMMARY

The attached report was considered by the Board at its August 20, 2025 meeting at which time the following resolution was passed:

Rice/Chapman: SRD 654/25

THAT a report be prepared to evaluate options for potential consolidation of the Oyster Riverbank protection and flood protection services into a single service.

The portions of the *Local Government Act* that address the amalgamation, consolidation or merger of regional district services are ss.349 and 350 (see Exhibit 1)). If the current riverbank and flood protection services shared the same boundaries a consolidation would be a relatively easy process to undertake since the financial impacts to ratepayers would be negligible or non-existent. However, in the present case the intent is to extend the responsibility for riverbank armouring to include all the benefiting properties in the Oyster River floodplain and increase the annual budgetary requirements for maintenance of the Glenmore Road dike. This will add complexity to the process of consolidation since the historical investments by different groups of taxpayers must be taken into account as part of the consolidation process. There appear to be a couple of different ways that this initiative could be approached:

Option A – amend the flood protection service to increase the annual requisition limit and to extend the authorities already contained in the riverbank protection service. The riverbank protection service would then be repealed upon adoption of the revised flood protection service.

Option B – expand the boundaries of the riverbank protection service to reflect the same boundaries as the flood protection service. A separate bylaw would be needed to increase the requisition limit for the flood protection service. Once the amended bylaws are adopted, it is believed that the 2 services could be merged without much difficulty.

A recent geomorphic and structural inspection of the Oyster River found that while no urgent capital works are needed, both the dike and bank armouring require recurring maintenance and planning for long-term renewal. These assets are physically connected and function interdependently of one another but serve a common benefit of protecting land and property from erosion and flooding. Merging the two services will improve financial sustainability, create a single

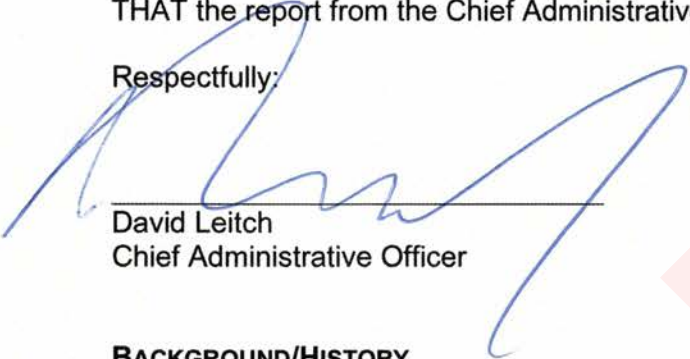
erosion and flooding. Merging the two services will improve financial sustainability, create a single funding mechanism, and distribute costs more equitably across the larger benefiting area, while ensuring that long-term inspection and maintenance needs are adequately funded.

A preliminary timeline based on Option B has been prepared for the Board’s information and is appended to this report (Exhibit 2). The schedule assumes that the approval for the amended flood protection service can be obtained from the Ministry of Municipal Affairs without the need to obtain approval of the electors. If approval of the electors is required the elapsed time will need to be increased by 2-3 months and, in that case, the Board will need to determine if it wishes to obtain elector approval using a petition, assent voting opportunity or alternative approval process.

RECOMMENDATION

THAT the report from the Chief Administrative Officer be received.

Respectfully:



David Leitch
Chief Administrative Officer

BACKGROUND/HISTORY

The Oyster Riverbank protection specified area was established in 1976 and converted to a local service in 1990 by the Comox-Strathcona Regional District (CSRD). The service area includes 35 properties and was used to raise funds to pay for armouring the north bank of the Oyster River where flooding and bank erosion had damaged or eroded private properties along Glenmore Road near Highway 19A. Following severe flooding of the Oyster River in 1990 a dike was constructed at the west end of Glenmore Road, but this infrastructure was partly located outside the riverbank protection service boundaries and there was no provision for its maintenance. A total of about \$80,000 has been collected over the years and is currently held in reserve to assist with capital and operating costs for the riverbank protection service. The responsibility for this service was transferred to the Strathcona Regional District in 2008.

In 2022 the Strathcona Regional District adopted Bylaw No. 457 and thereby established the Oyster River flood protection service. This service includes roughly 388 properties within Electoral Area D of the Strathcona Regional District lying within the Oyster River’s floodplain. This service also includes the 35 properties contained within the Oyster Riverbank protection service. The purpose of this flood protection service is to fund the operation and maintenance of the existing dike infrastructure that protects properties in the area from flood damage.

A recent geomorphic and structural inspection of the Oyster River found that while no urgent capital works are needed, both the dike and bank armouring require recurring maintenance and planning for long-term renewal. These assets are physically connected and functionally interdependent, serving a common benefit of protecting land and property from erosion and flooding. Merging the two services will create a single funding mechanism and distribute costs more equitably across a larger benefiting area, while ensuring that long-term inspection and maintenance needs are adequately funded.

FINANCIAL IMPLICATIONS

Generally speaking, an increase in the number of properties responsible for the riverbank protection service would result in a reduction of the individual household costs. However, it is believed that the current budget is insufficient to adequately provide the required inspection and maintenance for this infrastructure. Similarly, the report from KWL suggests that the current limit

for the flood protection service will not be enough to cover the longer-term costs associated with proper maintenance of this infrastructure.

The KWL report identifies the need for additional annual maintenance and inspection requirements of approximately \$8,500 for the bank protection works and \$12,000 for the flood protection works. With consolidation of the service areas this would result in an annual requisition of approximately \$46.66/property beginning in 2026. Properties within the Flood Protection service currently pay \$17.40 per year, while those in the Riverbank Protection service pay the same amount plus an additional \$14.99 annually. The current requisition is insufficient to fund the amounts estimated in the KWL report. Should the service areas not be consolidated, the need to increase requisition in both services still exists, however costs to the Riverbank protection service would be much higher as there are only a small number of properties within this service area compared to the Flood protection service.

Financial implications of the recommended maintenance and inspection work will be presented during the 2026 financial planning process.

LEGAL IMPLICATIONS

Any change to the boundaries of the riverbank protection or flood protection services will require amendments to the appropriate bylaws and may also require elector approval. The specific approvals that may be required will depend in part on the review by the Ministry of Municipal Affairs of any plans to merge, amalgamate or consolidate the 2 existing services.

INTERGOVERNMENTAL/REGIONAL IMPLICATIONS

The Comox Valley Regional District (CVRD) is aware of the development of services by the Strathcona Regional District to maintain flood control infrastructure along Oyster River, however it is not known if there are similar efforts being made on the south side of the river. In addition to the CVRD, the Province of BC has an interest in controlling flooding through enactment of construction standards for flood control systems and by providing funding for such systems in accordance with its policies. Additionally, according to the report by KWL one of the abutments supporting the Highway 19A bridge should be examined further to determine its susceptibility to damage caused by Oyster River waterflows.

CITIZEN/PUBLIC RELATIONS IMPLICATIONS

As a part of its commitment to transparency, the Regional District will engage with the public to ensure that the rationale for examining this issue is clearly understood. Should elector approval be required before consolidating the two services, the Regional District will undertake to provide information that can be used by individuals as part of the approval process.

From a community perspective, consolidation will improve equity across the benefiting properties. At present, only 35 properties carry the cost of riverbank protection, while approximately 388 properties benefit from the flood protection service. A merged service would spread costs across the broader floodplain community, easing the disproportionate burden on a small number of landowners while ensuring that all benefiting properties contribute fairly to the long-term protection of homes, infrastructure, and public safety.

INTERDEPARTMENTAL INVOLVEMENT/IMPLICATIONS

The process of service consolidation will be primarily the responsibility of corporate staff, although the engineering division will be relied upon to provide information on the rationale and costs associated with the proposed maintenance of riverbank and dike infrastructure within the Oyster River floodplain.

Prepared by: *T. Yates, Corporate Services Manager & S. Fisher, Engineering Services Manager*

Attachment: Bylaw No. 1171 (Oyster Riverbank Protection)
Bylaw No. 457 (Oyster River Floodplain Protection)
Copy of August 8, 2025 report to the Board

Exhibit 1 (Extract from LGA)**Amendment or repeal of establishing bylaws**

349. (1) Subject to an order under subsection (4) or (5), an establishing bylaw may be amended or repealed, at the option of the board,
- (a) in accordance with the requirements applicable to the adoption of the bylaw that it amends or repeals, or
 - (b) with the consent of at least 2/3 of the participants.
- (2) Sections 346 [consent on behalf of municipal participating area] and 347 (2) to (4) [consent on behalf of electoral participating area] apply to consent under subsection (1) (b) of this section.
- (3) A bylaw amending or repealing an establishing bylaw has no effect unless it is approved by the inspector.
- (4) The minister may order that a bylaw amending or repealing an establishing bylaw may be adopted only in accordance with the requirements applicable to the adoption of the bylaw that it repeals or amends.
- (5) In addition to the requirement under subsection (1) or (4), as applicable, the minister may order that, before the bylaw is adopted, it must receive the approval of the electors
- (a) in one or more specified participating areas, or in specified parts of one or more participating areas, or
 - (b) in the entire service area,
- obtained in accordance with section 344 [*approval by assent of the electors*] or 345 [*approval by alternative approval process*], as specified by the minister.
- (6) Section 137 (2) [*minister may waive requirement for elector assent or approval*] of the Community Charter does not apply to a bylaw amending or repealing an establishing bylaw.
- (7) The regional district corporate officer must file with the inspector a bylaw amending or repealing an establishing bylaw after it has been adopted.

RS2015-1-349 (B.C. Reg. 257/2015).

Changes to participating and service areas

350. (1) A bylaw amending an establishing bylaw may provide for changes to the boundaries of a service area, including merging 2 or more service areas.
- (2) If a bylaw amending an establishing bylaw extends an existing service to a new participating area, the proposed participating area must be included as a participating area and the participant for the proposed participating area must be included as a participant for the purposes of section 349.

RS2015-1-350 (B.C. Reg. 257/2015).

Exhibit 2

Proposed timetable for consolidating Oyster River services assuming Option B is selected.

Schedule	Action
September 3, 2025	Electoral Areas Services Committee reviews report on Oyster River service consolidation and recommends the Board proceed with initiative.
September 17, 2025	Board reviews report on consolidation of Oyster River bank protection and flood protection services and authorizes preparation of bylaws.
October 22, 2025	Board gives first 3 readings to Oyster River Flood Protection, Amendment Bylaw No. [redacted] and Oyster River Bank Protection, Amendment Bylaw No. [redacted].
October 29, 2025	Director consent for Bylaws No. [redacted] and [redacted] obtained pursuant to s.347 <i>Local Government Act</i> .
October 31, 2025	Bylaws No. [redacted] and [redacted] submitted to Inspector of Municipalities for approval under s.349 of the <i>Local Government Act</i> .
December 17, 2025	Approval received for Bylaws No. [redacted] and [redacted] from Inspector of Municipalities.
January 28, 2026	Oyster River Flood Protection, Amendment Bylaw No. [redacted] and Oyster River Bank Protection, Amendment Bylaw No. [redacted] adopted by Regional Board. Board gives first 3 readings to Oyster River Service Merging Bylaw No. [redacted].
January 30, 2026	Oyster River Service Merging Bylaw No. [redacted] submitted to Inspector of Municipalities for approval under s.349 of the <i>Local Government Act</i> .
March 18, 2026	Inspector of Municipalities approval received for Oyster River Service Merging Bylaw No. [redacted].
March 25, 2026	Oyster River Service Merging Bylaw No. [redacted] adopted by the Board. Financial Plan adopted for new consolidated Oyster River service.

EXHIBIT 3 – SERVICE REQUISITION (CURRENT AND PROPOSED)

Service	Requisition Limit (Current)	Requisition Limit (proposed)	Requisition Limit Increase	Cost per \$1,000,000 Home
Riverbank protection service	\$18,000	\$-----	(\$18,000)	(\$569.24)
Flood protection service	8,399*	37,000	28,601	110.76

*BASED ON CURRENT TAX RATE LIMIT OF 0.0270 PER 1,000 OF ASSESSED VALUES

COPY

REGIONAL DISTRICT OF COMOX-STRATHCONA

BY-LAW NO. 1171

**A By-law to convert a River Bank Protection
Specified Area to a Local Service Area.**

WHEREAS under Section 767(4) of the Municipal Act, a regional district exercising a power to provide a service other than a general service, shall adopt a by-law respecting that service which:

- a) meets the requirements of Section 794 of an establishment by-law; and
- b) is adopted in accordance with the requirements of Section 802 as if it were a by-law amending an establishment by-law.

AND WHEREAS the Regional Board of the Regional District of Comox-Strathcona established by By-law No. 221 cited as "Oyster River Bank Protection Specified Area Establishment and Loan Authorization By-law 1970 (Second)", a specified area for the provision of river bank protection within a portion of Electoral Area "D";

AND WHEREAS the Regional Board of the Regional District of Comox-Strathcona wishes to convert the aforesaid river bank protection service specified area to a local service;

NOW THEREFORE, the Regional Board of the Regional District of Comox-Strathcona, in open meeting assembled, enacts as follows:

1. The river bank protection service provided within the specified area created under By-law No. 221 cited as "Oyster River Bank Protection Specified Area Establishment and Loan Authorization By-law 1970 (Second)" is hereby established as a local service for that portion of Electoral Area "D" shown outlined on the plan attached, as Schedule "A", to this By-law and known as "Oyster River Bank Protection Local Service Area".
2. The maximum amount that may be expended for annual operating costs for the service provided under Section 1 shall be \$5,000.00.
3. The annual operating and debt servicing costs shall be recovered by requisition of money to be collected by a property value tax on land and improvements.
4. This By-law may be cited as "**OYSTER RIVER BANK PROTECTION LOCAL SERVICE ESTABLISHMENT BY-LAW, 1989.**"

READ A FIRST AND SECOND TIME THIS 27th **DAY OF** November, 1989.
READ A THIRD TIME THIS 27th **DAY OF** November, 1989.

I hereby certify the foregoing to be a true and correct copy of "Oyster River Bank Protection Local Service Establishment By-law, 1989" as read a third time by the Board of the Regional District of Comox-Strathcona on the 27th day of November, 1989.

W.A. Egan
Secretary

APPROVED BY THE
INSPECTOR OF MUNICIPALITIES THIS 16th **DAY OF** January, 1990.

RECONSIDERED,
FINALLY PASSED AND ADOPTED THIS 29th **DAY OF** January, 1990.

W.H. Wilson
Chairperson

W.A. Egan
Secretary

I hereby certify the foregoing to be a true and correct copy of "Oyster River Bank Protection Local Service Establishment By-law, 1989" as adopted by the Board of the Regional District of Comox-Strathcona on the 29th day of January, 1990.

W.A. Egan
Secretary

Province of British Columbia



No.

Statutory Approval


Under the provisions of section 802(6)

of the Municipal Act

I hereby approve Bylaw No. 1171

of Regional District of Comox-Strathcona, *a copy*
of which is attached hereto.

Dated this 16th day
of January, 1990


Deputy Inspector of Municipalities



BYLAW NO. 457

A BYLAW TO ESTABLISH A FLOOD PROTECTION SERVICE FOR PART OF ELECTORAL AREA D (OYSTER BAY-BUTTLE LAKE)

WHEREAS the Regional District may, pursuant to the *Local Government Act*, operate any service that it considers necessary or desirable for all or part of the Regional District;

AND WHEREAS the Regional District wishes to establish a flood protection service within part of Electoral Area D (Oyster Bay-Buttle Lake);

AND WHEREAS the assent of the electors has been obtained pursuant to Section 342 of the *Local Government Act*;

NOW THEREFORE the Board of Directors of the Strathcona Regional District, in open meeting assembled, enacts as follows:

Service Established

1. There is hereby established a service to be known as the Oyster River flood protection service.

Participating Area

2. The participating area for the service is Electoral Area D (Oyster Bay-Buttle Lake).

Service Area

3. The area for the Oyster River flood protection service comprises that part of Electoral Area D shown outlined in bold on Schedule 'A', attached to and forming part of this bylaw.

Service Defined

4. The Regional District may construct, reconstruct, operate, maintain and repair flood protection infrastructure within the service area including dikes and related infrastructure and, without limiting the generality of the foregoing, enlarge and improve such facilities to ensure operational integrity.

Cost Recovery

5. The annual net cost of the service shall be recovered by one or more of the following:
 - a) property value taxes imposed in accordance with the *Local Government Act*;
 - b) revenues received by way of agreement, enterprise, gift, grant or otherwise;

- c) revenues raised by other means authorized by the *Local Government Act* or another Act.

Annual Requisition Limit

- 6. The maximum amount that may be requisitioned annually for the service is \$8,350 (Eight Thousand, Three Hundred and Fifty Dollars) or the equivalent of \$0.0270 per 1,000 of the net taxable value of land and improvements in the service area, whichever is greater.

Citation

- 7. This bylaw may be cited for all purposes as Bylaw No. 457, being Oyster River Flood Protection Service Establishing Bylaw 2022.

READ A FIRST TIME ON THE 16TH DAY OF MARCH, 2022

READ A SECOND TIME ON THE 16TH DAY OF MARCH, 2022

READ A THIRD TIME ON THE 16TH DAY OF MARCH, 2022

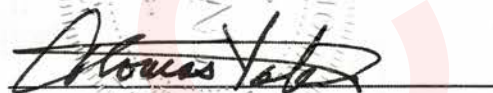
APPROVED BY THE INSPECTOR OF MUNICIPALITIES ON THE 29TH DAY OF APRIL, 2022

ASSENT OF THE ELECTORS RECEIVED ON THE 6TH DAY OF JULY, 2022

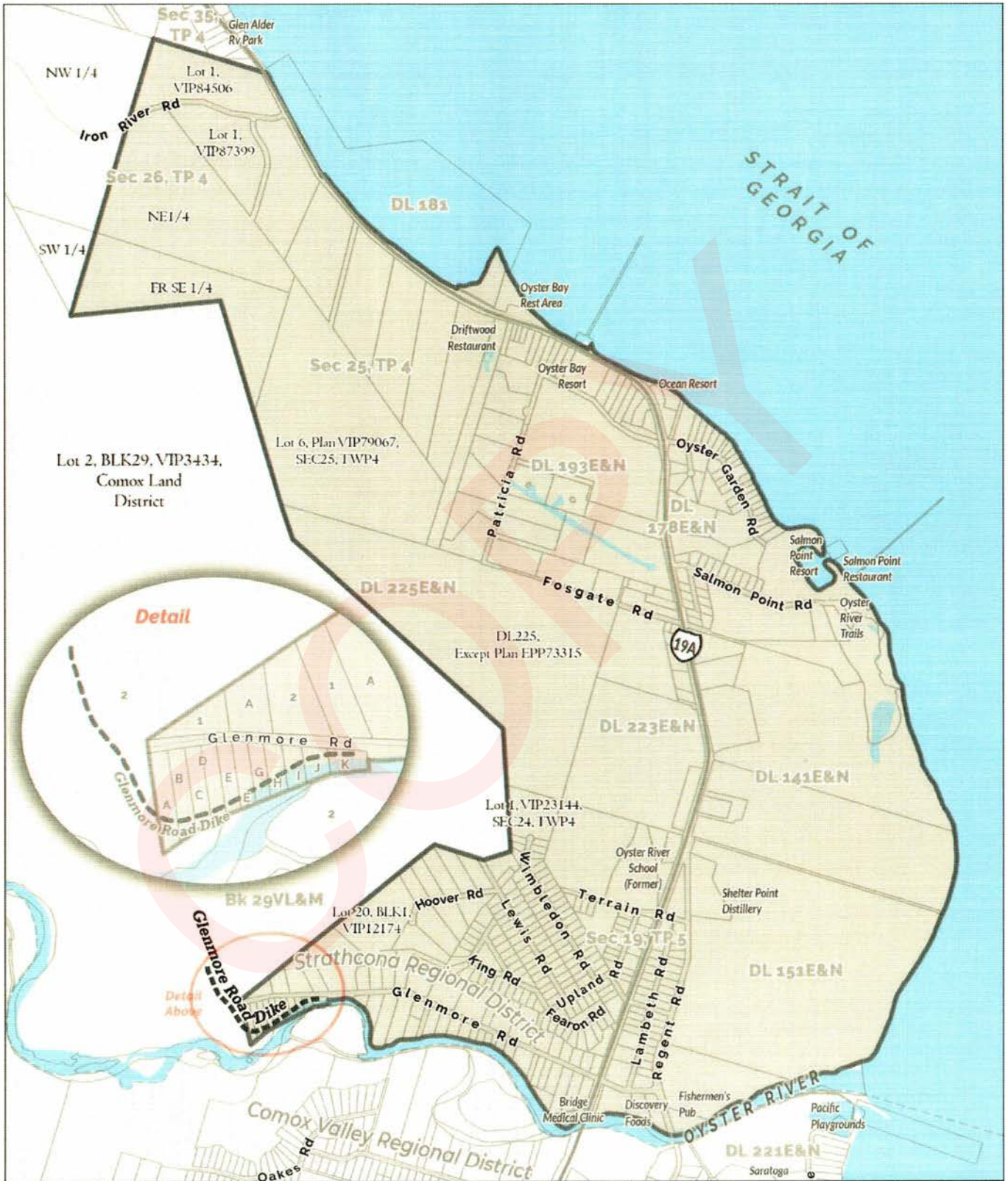
RECONSIDERED, FINALLY PASSED AND ADOPTED ON THE 13TH DAY OF JULY, 2022



Chair

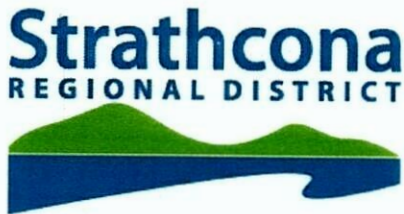


Corporate Officer



Appendix 'A' to Bylaw No. 457





STAFF REPORT

DATE: August 8, 2025

FILE: 0550-04 Board

TO: Chair and Directors
Regional Board

FROM: David Leitch
Chief Administrative Officer

RE: OYSTER RIVERBANK INSPECTION – LONG TERM MANAGEMENT PLAN

PURPOSE/PROBLEM

To consider recommendations from the Electoral Areas Services Committee regarding the bank armouring and flood protection services currently in place for Oyster River in Electoral Area D.

EXECUTIVE SUMMARY

The attached report was considered at the August 6, 2025 meeting of the Electoral Areas Services Committee at which time the following resolutions were passed:

Rice/Vonesch: EASC 196/25

THAT the works outlined in the KWL report be considered in the 2026-2030 Financial Plan and single participant budget discussions.

Rice/Mawhinney: EASC 197/25

THAT a staff report be prepared to evaluate options for potential consolidation of the Bank Protection (Function 790) and Flood Protection (Function 296) services into a single service.

The following actions are offered in support of the Committee's recommendations.

RECOMMENDATIONS

1. THAT the report from the Chief Administrative Officer be received.
2. THAT the works outlined in the KWL report on Oyster River be considered in the 2026-2030 Financial Plan and single participant budget discussions.
3. THAT a staff report be prepared to evaluate options for potential consolidation of the Oyster River bank protection and flood protection services into a single service.

Respectfully:


David Leitch
Chief Administrative Officer

Prepared by: T. Yates, Corporate Services Manager

Attachments: Copy of August 1, 2025 report to the EASC

COPY



STAFF REPORT

DATE: August 1, 2025 **FILE:**0550-04 EASC

TO: Chair and Directors,
Electoral Areas Services Committee

FROM: Dave Leitch
Chief Administrative Officer

RE: OSTER RIVERBANK INSPECTION – LONG TERM MANAGEMENT PLAN

PURPOSE/PROBLEM

To present the results of the 2025 Oyster Riverbank inspection and geomorphic assessment, and to initiate discussion around long-term asset management needs and funding requirements.

EXECUTIVE SUMMARY

At its May 8, 2024 meeting the Board considered the attached report and passed the following resolution:

Rice/Vonesch: SRD 506/24

THAT an application to the Infrastructure Planning Grant Program for \$10,000 be submitted to assist with funding to complete the Oyster River and Coastal Lands Riverbank Inspection.

The \$10,000 grant was approved, and the Strathcona Regional District (SRD) retained Kerr Wood Leidal Associates Ltd. (KWL) to undertake the inspection. The scope of work included a geomorphic and structural assessment of approximately 2 km of the north (left) bank of the lower Oyster River, between the Glenmore Dike and the Oyster River estuary. Although the assessment focused on SRD-managed infrastructure, cross-boundary and inter-agency issues were also considered.

The inspection concluded that erosion protection works installed by the SRD along Glenmore Road remain largely intact and stable. However, active erosion was observed downstream within the Oyster River Nature Park. SRD Parks staff have addressed immediate public safety concerns by managing trail impacts and removing a large conifer undermined by bank failure.

While no urgent capital works are required, the KWL report identifies recurring maintenance needs and recommends development of a long-term asset management plan. The recommendations have impact on both Function 790 (Oyster River bank protection service) and Function 296 (Oyster River flood protection service).

Although these two services were established independently, they serve a shared purpose: protecting land and property from erosion and flooding caused by high water events along the same reach of the Oyster River. The infrastructure is physically connected, and many of the recommended maintenance and monitoring activities are functionally interdependent.

Merging the two services may be an option that could improve financial sustainability by creating a single funding mechanism that supports both the dike and bank protection works, providing an equal benefit to all properties within the two service areas. In support of this concept, staff could prepare a follow-up report evaluating the feasibility of consolidating the two services into a unified service area with a common requisition. This approach would likely improve equity by spreading costs across a larger benefiting area.

The maintenance and asset management needs identified in the KWL report can be brought forward for consideration as part of the 2026–2030 Financial Plan, alongside the recommendations below.

RECOMMENDATIONS

1. THAT the report from the Chief Administrative Officer be received.
2. THAT the works outlined in the KWL report be considered in the 2026–2030 Financial Plan and single participant budget discussions.
3. THAT a staff report be prepared to evaluate options for potential consolidation of the Bank Protection (Function 790) and Flood Protection (Function 296) services into a single service.

Respectfully:



Dave Leitch
Chief Administrative Officer

BACKGROUND

Function 790 – Oyster Riverbank Protection Service was established in 1976. It includes 35 properties along the Oyster River. The current bylaw limits the maximum annual requisition for this service to \$18,000. The service was initiated in response to a high-water event that caused bank erosion and other damage to property. Initial stabilization measures were implemented through a 75–25 cost-sharing grant with the Province.

In 1980, the Provincial Emergency Program funded \$230,000 worth of repairs, including bank reinforcement and logjam removal. Following another flood in 1990, the Glenmore Road dike was constructed under a shared funding agreement between the Province and the former Comox-Strathcona Regional District (CSRD). The CSRD did not establish a formal dike protection service, nor was one created before the 2008 formation of the Strathcona Regional District, which inherited responsibility for the dike.

In 2010, the SRD secured grant funding to rehabilitate the dike crest, remove vegetation, and repair a non-functional flap gate. The 2017 dike inspection report identified new deficiencies and included cost estimates and maintenance recommendations. In 2022, the SRD established Function 296 – Oyster River flood protection service through Bylaw No. 457. This created a dedicated operating budget of \$8,350 annually to support and maintain the Glenmore Road dike structure and related flood protection works.

Although the bank armouring (Function 790) and the dike (Function 296) are supported by separate services, they share a common purpose—protecting land and property from erosion and flooding caused by high water events. Given their functional alignment and overlapping infrastructure needs, consolidation into a single service may provide efficiencies and long-term funding stability.

Key findings from the 2025 inspection include:

- a condition assessment of approximately 2 km of left-bank armoring
- a geomorphic evaluation of both banks and the estuary
- identification of long-term risks related to erosion, sedimentation and potential channel migration
- consideration of interjurisdictional responsibilities involving the SRD, CVRD, and MoTT
- long-term asset management and maintenance recommendations

The bank armouring was found to be generally effective, with only localized rock loss. However, ongoing erosion at Oyster River Nature Park and sediment buildup in the estuary were flagged as future concerns. No urgent capital works are needed at this time, but continued monitoring and planning are essential.

To support long-term service delivery, the following asset management and maintenance activities were recommended:

Function 790 – Bank Protection Service

Activity	Estimated Annual Cost
Vegetation Management	\$2,500
Monitor Bank Erosion (10-year cycle)	\$1,000
Monitor Riprap Stability (10-year cycle)	\$1,000
Channel Cross-Section Re-survey (10-year cycle)	\$2,000
Periodic Inspections (10-year cycle)	\$2,000
Total	\$8,500/year

Function 296 – Flood Protection Service

Activity	Estimated Annual Cost
Riprap Reserve (20% renewal over 75 years @ \$3,000/meter)	\$12,000
Total	\$12,000/year

Note: These costs are indicative and assume routine maintenance and renewal only. Emergency or disaster-related expenses are not included.

FINANCIAL IMPLICATIONS

The study was completed on budget at \$36,875.04. A \$10,000 Infrastructure Planning Grant was approved, with the remaining \$26,875 funded through reserve transfers from Function 790 – Bank Protection.

If the 2 services remain separate, each will face different short-term funding challenges. The riverbank protection service has sufficient reserves and available room within its current \$18,000 requisition ceiling to implement the recommended \$8,500 in annual maintenance activities. A phased increase could be used to gradually reach this level, helping to preserve capital reserves for future works or emergency response.

By contrast, the flood protection service is already at its maximum allowable requisition of \$8,350. The full amount is currently allocated to core operating requirements, including mandatory dike inspections under the Dike Maintenance Act, flap gate maintenance, and vegetation management. The additional \$12,000 in lifecycle funding recommended for riprap renewal exceeds the current requisition ceiling and cannot be implemented unless the bylaw is amended to increase the annual requisition limit. While the bylaw permits a 25% increase without elector approval after July 2027, no increase is currently allowed without first obtaining that approval. Without new funding, the flood protection service will continue to underfund its long-term renewal needs, increasing future financial pressure.

Merging Function 790 (Bank Protection) and Function 296 (Flood Protection) into a single, consolidated service may be an option that provides a more equitable distribution of costs if it can be determined that the users within the two services receive the same benefit. Under a consolidated service, the approximately \$8,000 currently requisitioned from the 35 bank protection properties would be spread across the larger flood protection service area of approximately 445 properties. This would ease the financial burden on the smaller group of participants while creating a single funding mechanism for the full suite of flood protection works.

However, consolidation would require an increase to the service's requisition limit. In 2025, the combined operating budgets for the two functions totaled roughly \$16,750. Implementing the asset management recommendations from the KWL report would require an additional \$20,500 annually, bringing the total operating need for a merged service to approximately \$37,000 per year. The use of gas tax and/or potential grants may also be an option for capital works that could enable the current requisition limits to remain unchanged.

A future report can be prepared to assess the feasibility of service consolidation, including analysis of governance, financial, and community engagement implications.

LEGAL IMPLICATIONS

There are no immediate legal implications arising from this report. Any future capital works, budget increases or bylaw amendments would require appropriate permits, compliance with statutory rights of way, and adherence to applicable regulatory approvals.

INTERGOVERNMENTAL/REGIONAL IMPLICATIONS

Several observations and recommendations relate to lands and infrastructure outside of the Strathcona Regional District's jurisdiction:

- Ministry of Transportation and Transit (MoTT): The study includes inspection findings at the Hwy 19A and Regent Road bridges. Conditions ranged from missing riprap to overly steep slopes on bridge abutments. Coordination with MoTT is recommended to address these issues and mitigate flood risks to property.
- Comox Valley Regional District (CVRD): The right bank (CVRD side) has less armouring and is more vulnerable to erosion and flooding. Sediment from actively eroding bluffs and log jams may contribute to increased flood risk. Coordination with CVRD is encouraged for future sediment management and long-term flood planning.

The full report has been shared with both MoTT and CVRD for their awareness and potential coordination on shared priorities.

Any increase to the requisition for Function 296 prior to 2027, or a requisition increase greater than 25% for Function 790, or the amalgamation of the two services —will require review and approval by the Ministry of Municipal Affairs as part of the bylaw amendment process. This review ensures that proposed changes to service scope or taxation are consistent with provincial legislation and good governance practices.

CITIZEN/PUBLIC RELATIONS IMPLICATIONS

The infrastructure supported by Functions 790 and 296 plays an important role in protecting private property along the Oyster River and within the river's floodplain. All works are located on private land, with SRD access enabled through registered rights of way. Any future maintenance or upgrades will be communicated in advance to affected property owners. If the services remain separate, any increase to the budget for riverbank protection would primarily affect just 35 properties, while changes to the flood protection service would be distributed across a much larger group of properties.

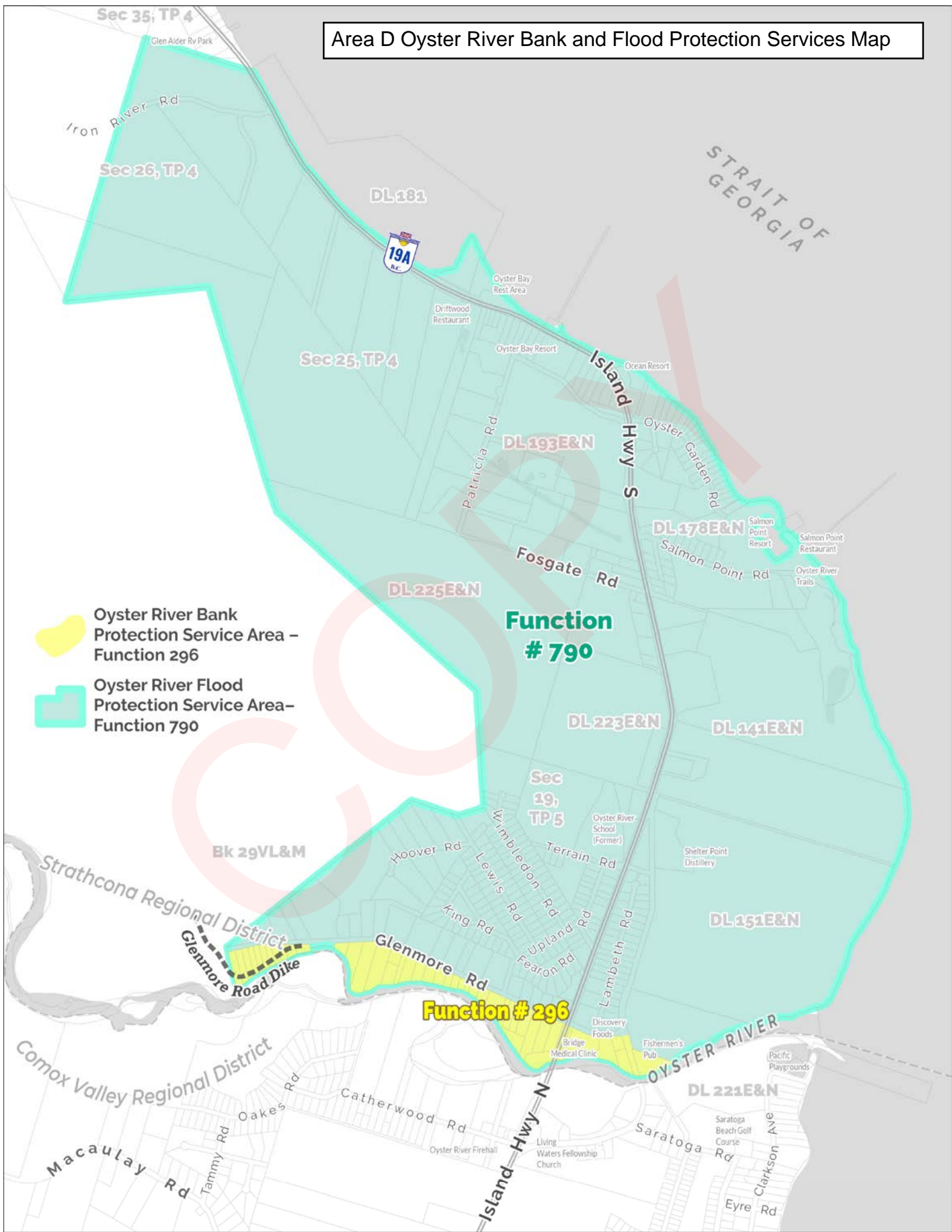
INTERDEPARTMENTAL INVOLVEMENT/IMPLICATIONS

The assessment report noted ongoing erosion within the Oyster River Nature Park and the presence of a park trail and sand dune habitat in proximity to the river mouth. These findings have been shared with Community Services for its review and consideration in future park planning, particularly as it relates to trail safety and habitat preservation. Any impacts or changes needed in future financial plans to respond to these recommendations will be discussed and coordinated with Finance.

Prepared by: Sheena Fisher, Engineering Services Manager

Attachments: Map showing the service areas for Functions 790 and 296
July 14, 2025 Oyster River Riverbank Inspection Report
20240621-Oyster-River-Bank-Inspection-Grant

Area D Oyster River Bank and Flood Protection Services Map





Technical Memorandum

DATE: July 24, 2025

TO: Sheena Fisher, PMP
Strathcona Regional District

FROM: Liam Mackle, P.Eng.

**RE: STRATHCONA REGIONAL DISTRICT
Oyster River Riverbank Inspection
Inspection Findings, Remediation Recommendations and Management Plan
Our File 3436.005-300**

1. Introduction

Kerr Wood Leidal Associates Ltd. (KWL) was retained by the Strathcona Regional District (SRD) to undertake an inspection and condition assessment of the north bank of the lower reach of the Oyster River. This assessment covers approximately 2 km of the river from the downstream end of Glenmore Dike to Oyster River Park and the Oyster River Estuary as shown in Figure 1. At this location, the Oyster River forms the jurisdictional boundary between the SRD on the north or left bank and Comox Valley Regional District (CVRD) on the south bank or right bank.

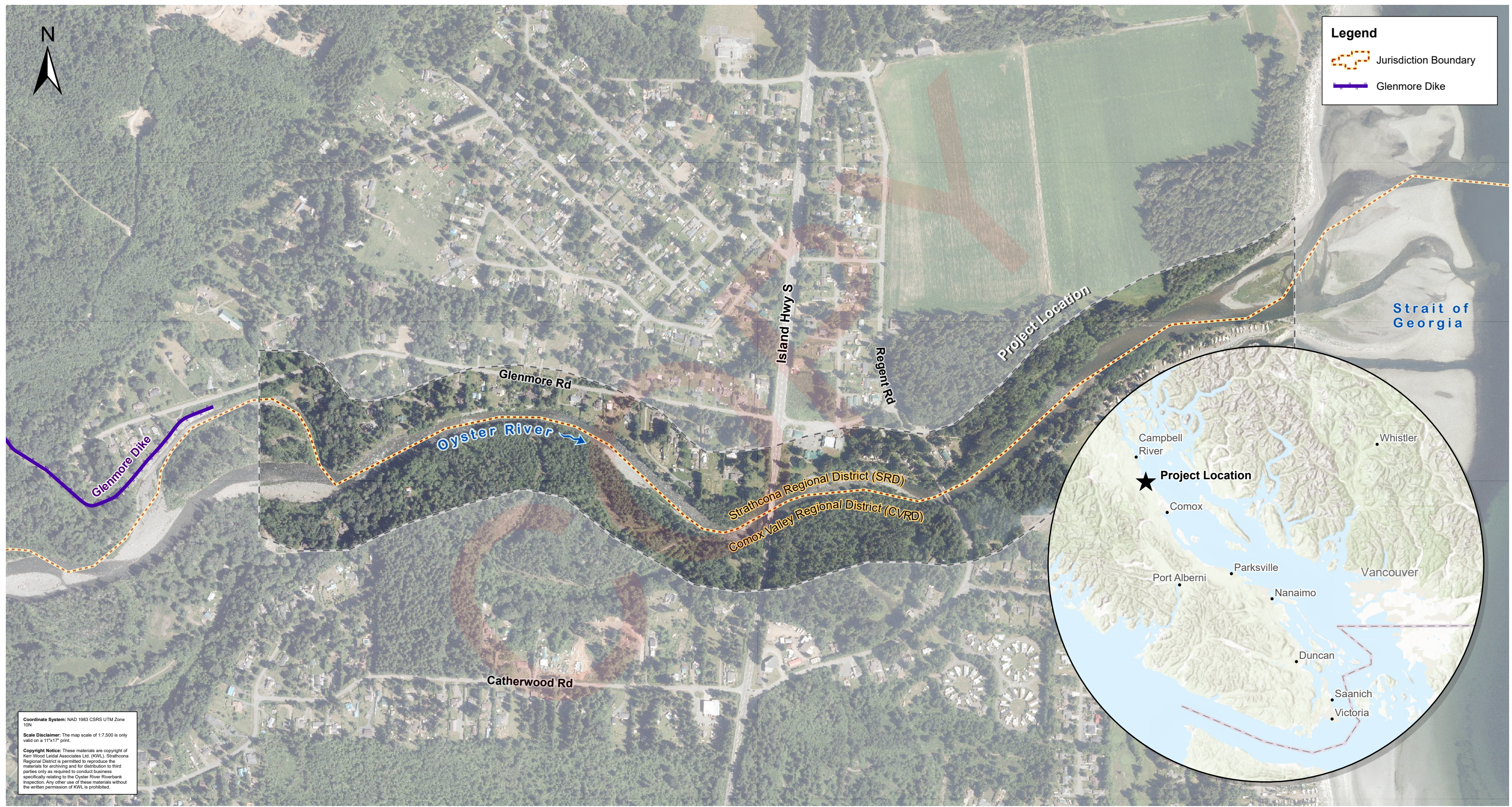
The work described in this report includes an inspection of the existing riverbank, bank armouring, and erosion protection measures on the north bank of the river, as well as an evaluation of the river geomorphology including both the north and south banks of the river. This holistic approach to geomorphic assessment considered that the river is a single system despite each bank lying in a separate Regional District, and therefore risks or activities on either side will have an impact to the whole river. Through this lens, bridges that are within the road right-of-way and fall under Ministry of Transportation and Transit (MoTT) jurisdiction were also included in the inspection and assessment. An inspection of the Glenmore Dike and associated bank protection works was also included as part of this project and was submitted as a separate standalone dike inspection checklist (Date Inspected August 8, 2024).

The work includes recommendations for remediation of erosion prone or high-risk areas and development of a management plan covering inspections, upgrades, and budgeting.

2. Site Description

Bank armouring and flood mitigation measures have been implemented by SRD in the lower reach of the Oyster River for many decades, consisting primarily of riprap bank armouring along several sections of the river as illustrated in Figure 2.

Flood mitigation works consist of the Glenmore dike at the upstream extent of the assessed area (shown in Figure 1 and Figure 2). The Glenmore Dike was constructed to address overland flooding risk to adjacent properties. Upgrades to the dike were completed in 2010 to improve the dike function including rebuilding a section, adding a semi-impermeable core, and replacing sections of riprap erosion protection.



Legend

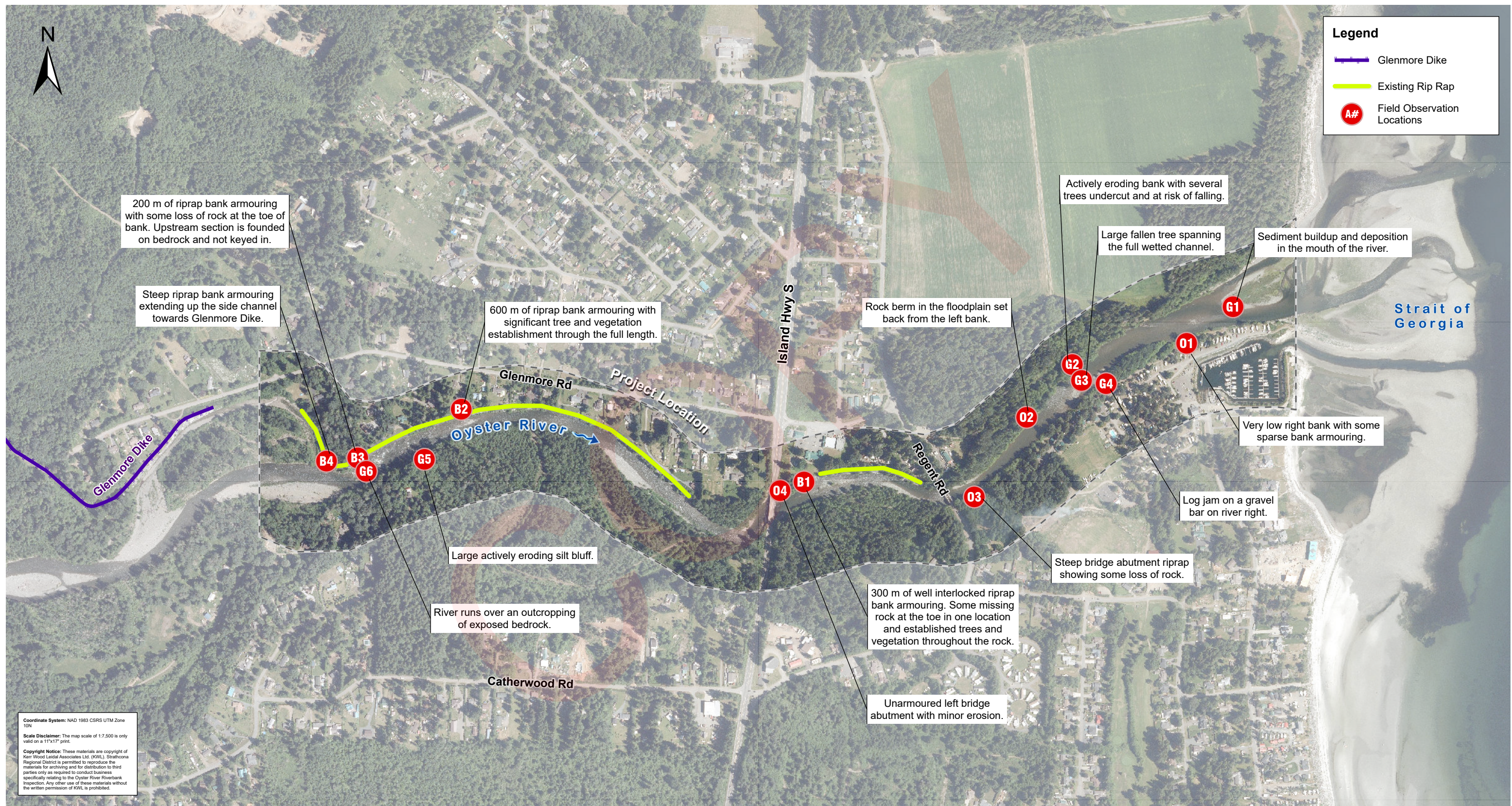
- Jurisdiction Boundary
- Glenmore Dike

Coordinate System: NAD 1983 CSRS UTM Zone 10N
Scale Disclaimer: The map scale of 1:7,500 is only valid on a 11"x17" print.
Copyright Notice: These materials are copyright of Kerr Wood Leidal Associates Ltd. (KWL). Strathcona Regional District is permitted to reproduce the materials for archiving and for distribution to third parties only as required to conduct business specifically relating to the Oyster River Riverbank Inspection. Any other use of these materials without the written permission of KWL is prohibited.

Project No. 3436.005
Date July 2025
Scale 1:7,500
0 50 100 200 m

Project Location

Figure 1



Project No. 3436.005
Date July 2025
Scale 1:7,500
0 50 100 200 m

Existing Bank Armoring and Flood Protection Measures and Field Observation Locations

Figure 2



3. Geomorphic Assessment Update

As part of a desktop fluvial geomorphology study and meander belt assessment completed by KWL in 2021 for the CVRD, observations of the lower reach of the Oyster River noted that the river has cut a meandering valley through the coastal plain sediments through its lower reach (Technical Memorandum #2 – Fluvial and Coastal Geomorphology, April 23, 2021). The study found that there is evidence of historic channels and associated alluvial deposits throughout the river valley. The assessment also identified that the area to the north of the river, where the Oyster River community is located, is an alluvial fan hazard area that could be subject to hazards such as overland flow and channel avulsion.

The previously completed desktop meander belt assessment used aerial orthophotos of the lower reach of the river to compare near historical changes in river plan form and morphology. More recent orthophotos from 2016, 2020, and 2022 were received from SRD for this project, and used to assess changes that may have occurred since the prior study was finalized. Review of these photos indicates that no new areas of significant erosion or notable changes to river form have occurred despite high river flow events occurring in 2016 and 2021.

4. Channel and Riverbank Inspection Findings

The riverbank inspection was carried out on August 7, 2024 by Liam Mackle and Chad Davey using a custom inspection template tool built in ArcGIS Survey123. The inspection parameters and procedures were based on methods described in the Flood Protection Works Inspection Guide (BC Water Management Branch, March 2000) and tailored to suit the location and needs of SRD. Inspection criteria collected included location, observation type, bank protection parameters (e.g., material, dimensions, crest elevation, filter layer, condition commentary), and general comments. The survey output has been included as Appendix A. Additional photos and observations were collected using ArcGIS Field Maps and included in Appendix A. The inspection was undertaken by foot through the main channel, with access achieved via the Highway 19A Oyster River Bridge.

The inspection included observations and field assessments of not only existing bank armouring, but also river channel form, active or potential erosion sites, sediment input or deposition, river substrate, and nearby infrastructure. While outside of the project scope, some additional observations of the right bank (CVRD jurisdiction) and bridge abutments (which are within the MoTT road right of way) are also included.

4.1 Bank Armouring and Erosion Protection Observations

Observations made on the existing bank armouring and erosion protection measures are summarized from downstream to upstream in Table 1. Photos of some of the indicated observations are included in the Photo Appendix (Appendix B). The locations are shown in Figure 2.



Table 1: Bank Armouring and Erosion Protection Observations

ID	Location	Observations
B1	Oyster River (19a) Bridge to Regent Road Bridge (Lat: 49.86881 Lon: -125.129584)	Approximately 300 m of riprap bank armouring spanning nearly the full distance between bridges. Rock is well interlocked at an approximately 2:1 slope with a median diameter (D50) estimated at 750 to 1000 mm. Several trees and Himalayan Blackberry have established within the rock apron especially at the upstream end (Photo 1). A small amount of rock loss at the toe was observed at the downstream end of the riffle.
B2	Downstream of Lorna Lane to approximately 100 m upstream of Oyster River (19a) Bridge (Lat: 49.869783 Lon: -125.139307)	Riprap bank armouring approximately 600 m long varying in diameter from 300 mm to 1,200 mm with much larger rock placed along the toe. Slope varies from 1:1 to 3:1 with full bank coverage that thins at its upper slope. Riprap is weathered, with condition generally fair and some undermined areas showing exposed bank (Photo 2). The furthest upstream section appears to be newer rock, however significant trees and vegetation have established in the interstitial spaces of the rock.
B3	Upstream limit of assessment area to Lorna Lane (Lat: 49.868942 Lon: -125.14218)	Approximately 200 m long riprap bank armouring with a D50 of 800 mm at a slope ranging from 2:1 to 1:1. The rock appears to be newer however some local loss was observed along the toe. Some vegetation has established in the bank and the instream base is founded on bedrock (Photo 3).
B4	Side channel and tie-in to Glenmore Dike (Lat: 49.868829 Lon: -125.143257)	Steep riprap placed at a 1:1 slope along the corner of the confluence of the side channel and river main stem. The full bank is covered with riprap with a diameter of 700 mm and greater. The riprap extends up the side channel an unknown distance towards the Glenmore Dike and into heavy vegetation (Photo 4).

Discussion

In general, the existing bank armouring along the left bank was robust and intact with two locations observed to have minor rock loss at the toe of bank. Erosion protection consisted wholly of angular riprap which was typically well interlocked and sized large enough to have minimal settling, slumping, or material loss observed. Extensive vegetation has grown through the riprap throughout its entire length, including shrubs, saplings, and mature trees. While vegetation establishment in riprap is generally not desirable, any removal of the existing growth could potentially cause stability issues as well as reduce valuable riparian overhanging growth and is therefore not recommended.



4.2 River Geomorphology Observations

Observations related to channel geomorphology including erosion and flooding risk factors are summarized in Table 2 and shown in Figure 2. Although the focus of the inspections was the north bank of the river, evaluating river geomorphology must consider the entire river channel and both riverbanks so observations were not limited to the left bank and SRD lands.

Table 2: Geomorphological Observations

ID	Location	Observations
G1	Oyster River Estuary (Lat: 49.872162 Lon: -125.117500)	Sediment appears to be accumulating and depositing at the mouth of the river, with potential to impact local flooding and/or contribute to future channel avulsion.
G2	Downstream end of Oyster River Nature Park (Lat: 49.870927 Lon: -125.121514)	Severely and actively eroding 3 m sand and gravel left bank. One mature tree has already been undercut and fallen, while another is 50% undercut and several others at risk in the near term (Photo 5).
G3	Oyster River Nature Park (Lat: 49.870927 Lon: -125.121514)	A large fallen tree with a trunk diameter of approximately 0.6 m spans the full wetted channel. This has the potential to trap additional debris and cause further erosion of the left bank (Photo 6)
G4	Oyster River Nature Park (Lat: 49.870896 Lon: -125.121404)	A log jam has developed on a gravel bar on river right (Photo 7). This has the potential to increase local flood levels, especially on the right bank which is low at this location (0.25 to 1 m height). Note that the right bank is outside of the SRD and the scope of this assessment.
G5	Right bank (CVRD) at Lorna Lane (Lat: 49.869401 Lon: -125.140776)	A large silt bluff is actively eroding and likely acting as a sediment input source to the river (Photo 8).
G6	Upstream limit of assessment area to Lorna Lane (Lat: 49.868942 Lon: -125.14218)	The river runs over an outcropping of exposed bedrock which results in effectively no risk of scour or undercutting of bank armouring (Photo 9).

Discussion

This reach of the Oyster River is generally stable upstream of the Regent Road bridge crossing due to the riprap armouring placed along of the left bank which results in low potential for future channel migration. Ongoing active erosion along the north bank at the Oyster River Nature Park could result in the channel shifting to the river left. Continued sediment deposition and aggradation in the estuary may have potential long-term impacts to flooding and channel migration at the river mouth. There is no hard infrastructure on the north side of the river at the river mouth that would be affected by channel migration, however there is a park trail and sand dune habitat. Impacts to flooding and channel migration could have a greater impact to the right bank and CVRD land.

In general, the armouring of the north bank of the Oyster River appears to be effective at preventing bank erosion and channel migration. The bank armouring may also provide a reduction in the flood risk by inhibiting migration of the channel into more vulnerable areas that are prone to flooding. However, limiting channel migration through armouring can promote sediment deposition within the channel which may increase the flood risk in some areas. How the armouring of the north bank of the Oyster River may alter sediment deposition and the flood risk in this area is not known and would require more detailed study.



4.3 Other Observations

Some additional observations were made during the inspection that fall outside of the project scope and SRD jurisdiction but have been included as part of a broader system assessment of this river reach. These locations are shown in Figure 2.

Table 3: Additional Observations

ID	Location	Observations
O1	Oyster River Estuary south (right) bank (Lat: 49.871636 Lon: -125.118946)	This section of bank is significantly lower than the left bank (0.25 to 1 m) and a clear preferential path for overland flooding. Some weathered, blocky bank armouring exists and is generally in poor condition (Photo 10).
O2	Oyster River Nature Park (Lat: 49.870112 Lon: -125.123316)	A berm has been constructed slightly set back from the left bank composed of poorly sorted rock with some tethered logs assumed to be a woody debris structure. Trees are growing through the berm in several sections, and its presumed function is to protect a wellhead in the parkland nearby. While not a bank armouring measure, it is presumed to provide some river training function during high river flows, despite its likely permeability (Photo 11).
O3	Regent Road Bridge, right bank (Lat: 49.868795 Lon: -125.124885)	Overly steep riprap of varied size on the right bridge abutment showing some material loss (Photo 12). A tributary enters the main channel upstream of the bridge which potentially increases erosion risk to the riprap apron.
O4	Oyster River Road Bridge (Lat: 49.868257 Lon: -125.130321)	There is no armouring on the left bridge abutment and the unprotected bank shows some minor erosion (Photo 13).

5. Remediation Recommendations

Based on the field observations, no erosion protection remediations or upgrades within SRD are recommended at this time. However, the monitoring of the condition of the bank protections measures should be continued including carrying out inspections after any significant flood events as discussed in the management plan below.

To reduce the identified risk of trapping additional debris and causing further erosion on the right bank, the fallen tree (Observation G3) was recommended to be cut into smaller sections and remove the limbs to allow it to float away during the next period of high water. This work was completed by SRD contractors on September 25, 2024. Any similar work required in the future could fall under the vegetation management plan recommended in the following section.



6. Management and Maintenance Planning

6.1 Long-term Maintenance

SRD Bylaw No. 457 established the Oyster River Flood Protection Service in March 2022, with an annual budget of at least \$8,350. This fund is used to construct, operate, and maintain flood protection infrastructure in a section of the SRD that includes the lower reach of the Oyster River and the area assessed under this work plan. While no immediate repairs or upgrades were identified through this assessment, it is likely that periodic maintenance will be required on the existing riprap armouring as part of long-term life cycle management of this asset. Costs associated with engineering assessment, design, permitting, construction, and administration of any future upgrades or repairs are likely to exceed the Oyster River Flood Protection Service budget, therefore KWL recommends that unused portions of this fund are put away annually towards a long-term asset renewal budget. SRD could also consider pursuing an annual increase of at least 2% to this budget to account for inflation and future cost escalation.

The lifespan of riprap bank armouring is dependent upon the quality of rock, construction methods, and maintenance, however it can be reasonably expected that properly installed riprap can last for several decades. There is a low likelihood of major repairs required over the next several decades due to normal river conditions, however the cost of repairing a section of bank armouring can be very high. For maintenance budget planning purposes, a 20% replacement was assumed over the approximately 1.5 km of existing riprap through this reach for a total of 300 m of new riprap. At an assumed cost of \$3,000/m of installed rock, this totals \$900,000 in construction costs. If this work is assumed to be required once in the next 75 years (by the year 2100), the annualized cost would be \$12,000. This cost covers regular life cycle management, and it is assumed that any large-scale damage caused by major flooding would be covered by other (e.g. federal and/or provincial disaster recovery) funding. This annualized amount exceeds the budget available under Bylaw No. 457, so additional funding sources may need to be identified in the future to make up potential budgetary shortfalls.

6.2 Asset Management Planning

The following items were identified under this assessment work and could be considered for a long-term management plan. These items could also form the basis for future funding and capital planning by the SRD and the Oyster River Flood Protection Service for costs that exceed the funds allocated under Bylaw No. 457. Estimated annual costs at an indicative level are provided for budgetary purposes and include regular maintenance. Costs associated with disaster recovery or emergency response from major flooding or other events are not included. Inspections and reporting were assumed to occur once every 10 years and include the bank erosion and riprap monitoring with a total cost of \$20,000 split between the tasks and annualized for budgeting purposes.

Table 4: Management Plan

Item	Description	Estimated Cost
Vegetation management plan	Removal of mature trees that have established within the existing riprap revetments is not recommended, however an annual maintenance program to remove invasive species such as Himalayan Blackberry could be developed and enacted.	\$2,500 (annually)



Item	Description	Estimated Cost
Monitor ongoing bank erosion at the Oyster River Nature Park	Potential armouring methods and erosion mitigation measures at the park were discussed onsite with SRD staff, however the effort, cost, and impact to trees that would result from any major erosion protection works resulted in a decision to not pursue this option further. This could be reassessed if ongoing erosion and land loss becomes a major issue or concern in the future. Regular maintenance monitoring is assumed to occur every ten years.	\$1,000 (annually)
Monitor riprap stability	Two areas of riprap toe rock loss were identified, however the armouring was still stable and there is no current need to repair or replace rock in these sections. This should be reassessed by a qualified professional following high flow events to ensure that the riprap remains stable and the additional undermining and material loss has not occurred. The furthest upstream section of riprap is grounded on bedrock and not keyed in. This section should also be assessed by a qualified professional following high flow events to ensure major shifting or material loss has not occurred. Regular maintenance monitoring is assumed to occur every ten years.	\$1,000 (annually)
Re-survey river cross sections to quantify changes	KWL understand that some transect surveys have been completed through the lower reach of the Oyster River, including work completed by KWL in 2019. These surveys should be updated to assess changes in channel cross-sectional geometry, and confirm the suspected ongoing deposition of sediment at the estuary. If sediment continues to aggrade through the lower reach, a sediment management program could be developed to maintain river outflows and reduce local flooding risk. Sediment monitoring and management work should also be coordinated with CVRD.	\$16,000
Establish a process to coordinate with CVRD	Bank protection measures on the right bank are fewer, and the bank height downstream of Regent Road is much lower. This means that flood risk and potential damage to property and infrastructure is much greater on the CVRD side of the Oyster River. Any future erosion mitigation measures enacted by SRD have the potential to shift the channel right and increase flood or erosion risk to the CVRD lands (and vice versa). Long term flood planning and strategies should be developed in concert with CVRD.	No cost
Establish a process to coordinate with MoTT	Bank armouring within the road right of way is presumed to be the responsibility of MoTT. Where the riprap is over steepened, failing, or nonexistent (such as at the left abutment of the 19a Bridge), there is an increased risk of flood damages that could impact SRD land. Contact should be established with the appropriate MoTT service area representative to discuss potential issues and coordinate future work.	No cost



7. Summary

An inspection and condition assessment of the north bank of the lower reach of the Oyster River was conducted on August 7, 2024. This assessment covered approximately 2 km of the river from the downstream end of Glenmore Dike to Oyster River Park and the Oyster River Estuary. The scope of the inspection included the riverbank, bank armouring, and erosion protection measures on the north bank of the river, as well as an evaluation of the river geomorphology including both the north and south banks of the river.

The Glenmore Dike at the upstream end of the inspected river reach serves as a structural mitigation against overland flooding on the north side of the river. An inspection of the Glenmore Dike and associated bank protection works was also performed and the results were submitted as a separate standalone dike inspection checklist (Date Inspected August 8, 2024).

Erosion protection through the lower reach of the Oyster River consists of approximately 1,200 m of angular riprap revetments in several sections along the north bank. Inspection of this riprap found it to be in generally good condition; however, the riprap was covered with shrubs and mature trees in several sections. Two sections of riprap erosion protection were observed to have some rock loss at the toe of the riprap slope, and it was recommended that these sections be monitored following high flow events to confirm that no further shifting or displacement of rock has occurred.

The north riverbank was found to be actively eroding and undercutting at the Oyster River Nature Park, which has resulted in trees being undermined and falling into the channel, with several other trees at risk to do so in the near term. It was recommended to remove a large fallen tree that had spanned the river, and this work was completed in September 2024.

The geomorphic assessment included a desktop analysis of changes in river morphology using aerial orthophotos. It was found that no notable erosion or changes in channel form have occurred since 2016. The field assessment of the channel noted that sediment appeared to be depositing in the estuary. Continued sediment deposition and aggradation in the estuary may have potential long-term impacts to flooding and channel migration at the river mouth. There is no hard infrastructure on the north side of the river at the river mouth that would be affected by channel migration, however there is a park trail and sand dune habitat. Impacts to flooding and channel migration could have a greater impact to the south bank which is under the jurisdiction of the CVRD.

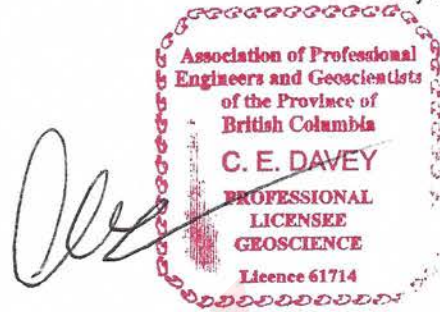
Some observations with respect to riverbank erosion protection and land elevation were made for the south bank in the CVRD. Observations with respect to erosion protection were also made at bridge abutments within the road right of way which is maintained by the provincial MoTT.

While no structural or remedial measures were recommended as a result of this inspection work, a management and maintenance plan was developed and costed at an indicative level. This work included long-term maintenance of riprap bank armouring, as well as an asset management plan that included recommendations for maintenance, monitoring, and coordination with adjacent stakeholders. An updated river cross sectional channel survey was also recommended to assess and quantify changes in channel geometry, especially at the estuary where ongoing aggradation is suspected to be occurring.



KERR WOOD LEIDAL ASSOCIATES LTD.

Prepared by:



Liam Mackle, PEng
Water Resources Engineer
Erosion Protection Assessment and Recommendations

Chad Davey, MSc, RPBio, PLGeo
Fluvial Geomorphologist
Geomorphic Assessment and Recommendations

Reviewed by:

Craig Sutherland, MSc, PEng, IRP
Senior Engineer

LTM/aah

Encl.: Appendix A: GIS Output
Appendix B: Photographs

Statement of Limitations

This document has been prepared by Kerr Wood Leidal Associates Ltd. (KWL) for the exclusive use and benefit of the intended recipient. No other party is entitled to rely on any of the conclusions, data, opinions, or any other information contained in this document.

This document represents KWL's best professional judgement based on the information available at the time of its completion and as appropriate for the project scope of work. Services performed in developing the content of this document have been conducted in a manner consistent with that level and skill ordinarily exercised by members of the engineering profession currently practising under similar conditions. No warranty, express or implied, is made.

Copyright Notice

These materials (text, tables, figures, and drawings included herein) are copyright of Kerr Wood Leidal Associates Ltd. (KWL). Strathcona Regional District is permitted to reproduce the materials for archiving and for distribution to third parties only as required to conduct business specifically relating to the Inspection Findings, Remediation Recommendations and Management Plan. Any other use of these materials without the written permission of KWL is prohibited.

Revision History

Revision #	Date	Status	Revision Description	Author
0	July 24, 2025	Final		LTM
A	April 10, 2025	Draft	Draft for Client Review	LTM



KERR WOOD LEIDAL
consulting engineers

Appendix A

GIS Outputs

COPY



KERR WOOD LEIDAL
consulting engineers

Field Maps

COPY

3436005_FM_Observations

Point



Notes

start of assessment. small riprap on right bank. largely ineffective

Image









3436005_FM_Observations

Point



Notes

sediment appears to be building up here

Image



3436005_FM_Observations

Point



Notes

25 m section of riprap with concrete blocks, near vertical and failing

Image



3436005_FM_Observations

Point



Notes

upstream end of riprap in ok condition

Image



3436005_FM_Observations

Point



Notes

left bank erosion, 3m tall bank of gravel. mature tree recent fallen, 2 others at risk. trails on bank appears to have eroded

Image

COPY





COPY

3436005_FM_Observations

Point



Notes

50 cm Dia tree spanning entire channel. concern it will further trap debris. ledt bank erosion

Image

COPY





COPY

3436005_FM_Observations

Point



Notes

log jam 50 m upstream of fallen tree. very low bank on right (0.25 to 1 m in height) risk of flooding on right bank

Image



3436005_FM_Observations

Point



Notes

old riprap from railway bridge. downstream extent on right bank

Image



3436005_FM_Observations

Point



Notes

newly built rock berm, wood debris cabled into bank

Image



3436005_FM_Observations

Point



Notes

upstream berm transitions to old berm structure. appears to protect well head or sewer infrastructure located here

Image



3436005_FM_Observations

Point



Notes

very steep blocky riprap on right bank downstream of railway bridge. OK condition

Image



3436005_FM_Observations

Point



Notes

small tributary upstream of bridge on right bank. riprap along abutment is poor shape but still offers some protection. surprised that bank on right is not worse given channel alignment

Image



3436005_FM_Observations

Point



Notes

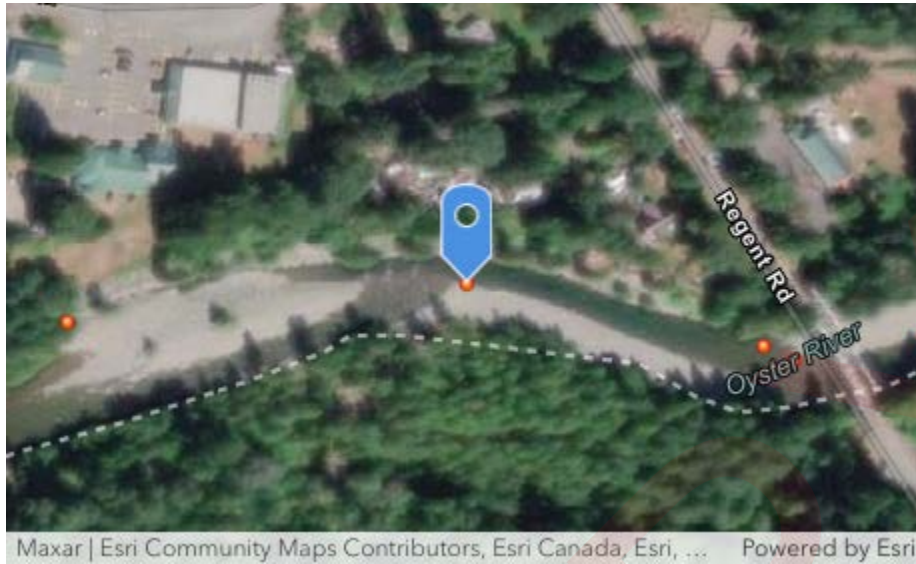
start of riprap downstream edge on left bank

Image



3436005_FM_Observations

Point



Notes

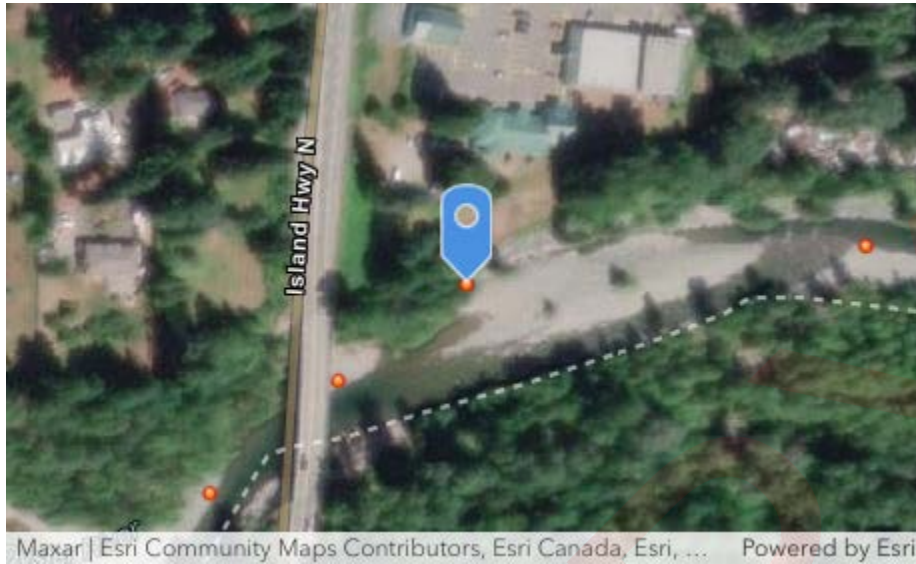
two spots where toe riprap is missing

Image



3436005_FM_Observations

Point



Notes

upstream limit of left bank riprap. 100 m downstream from bridge. riprap in good condition

Image



3436005_FM_Observations

Point



Notes

minor bank erosion along unprotected left bank at bridge

Image

COPY

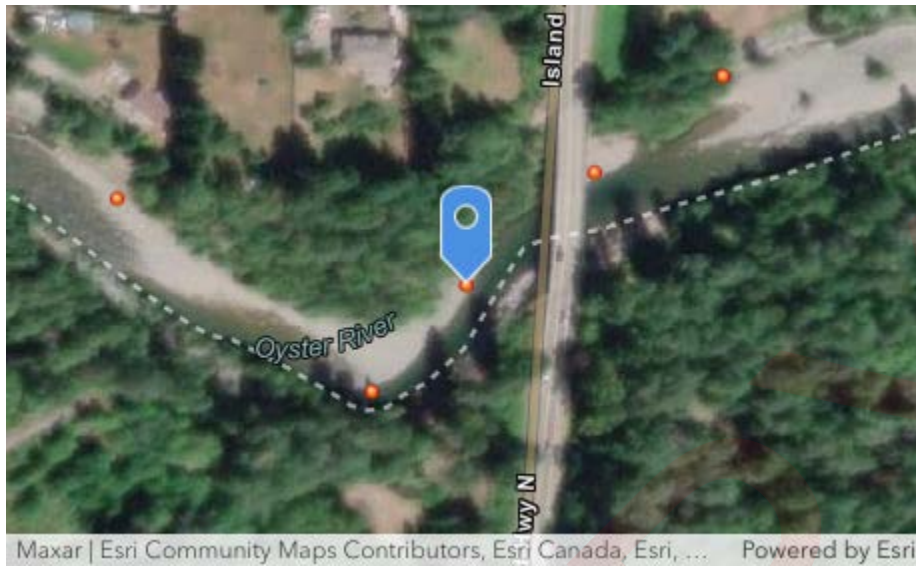




COPY

3436005_FM_Observations

Point



Notes

right bank riprap blends into bank riprap upstream. steep ok condition

Image

COPY





COPY

3436005_FM_Observations

Point



Notes

right bank riprap goes into forest.

Image



3436005_FM_Observations

Point



Notes

downstream extent of riprap on left bank. smallish

Image



3436005_FM_Observations

Point



Notes

small failure of riprap, bank exposed

Image

COPY





COPY

3436005_FM_Observations

Point



Notes

small riprap failure, bank exposed

Image



3436005_FM_Observations

Point



Notes

riprap on left bank appears to transition to lower elevation riprap (1 m lower)

Image



3436005_FM_Observations

Point



Notes

large silt bluff on right bank, actively eroding

Image



3436005_FM_Observations

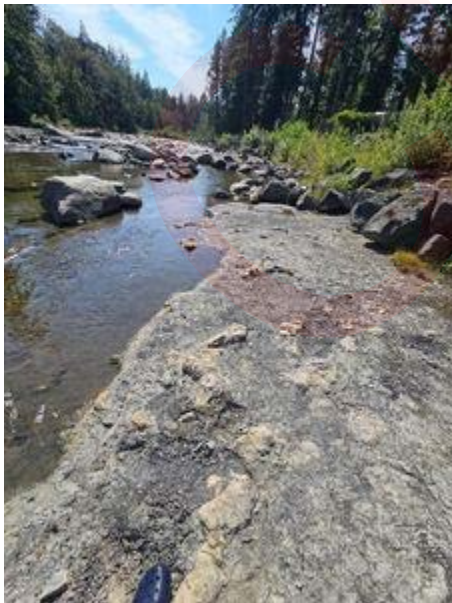
Point



Notes

bedrock outcrop

Image



3436005_FM_Observations

Point



Notes

upstream end of riprap on left bank, bedrock present across channel

Image



3436005_FM_Observations

Point



Notes

riprap section on point downstream of old channel outlet on left bank

Image



3436005_FM_Observations

Point



Notes

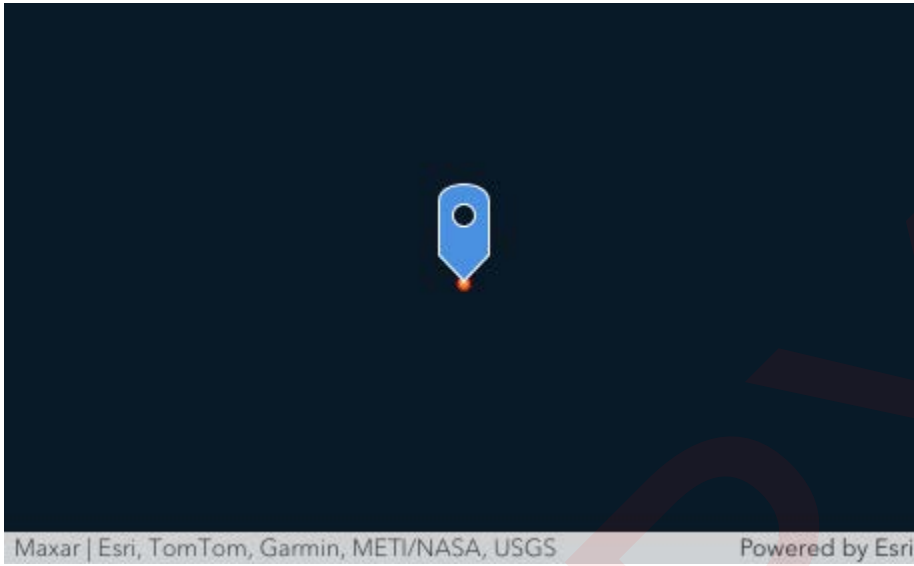
exit of old channel

Image



3436005_FM_Observations

Point



Notes

erosion along right bank due to debris

Image





3436005_FM_Observations

Point



Notes

Image

3436005_FM_Observations

Point



Notes

riprap is good condition

Image



3436005_FM_Observations

Point



Notes

large riprap in good condition

Image



3436005_FM_Observations

Point



Notes

rirap in good condition

Image



3436005_FM_Observations

Point



Notes

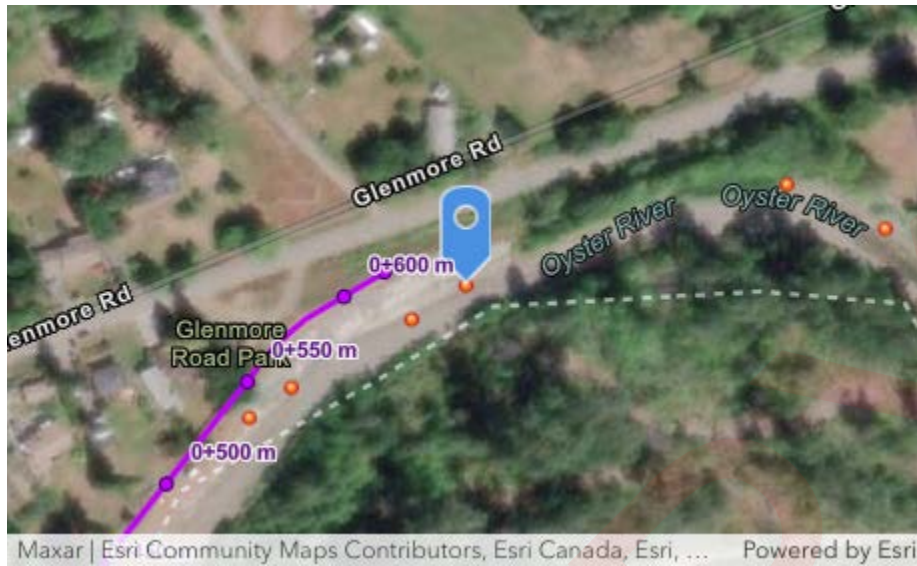
removal of shrubs needed. edge of dike ties into river riprap

Image



3436005_FM_Observations

Point



Notes

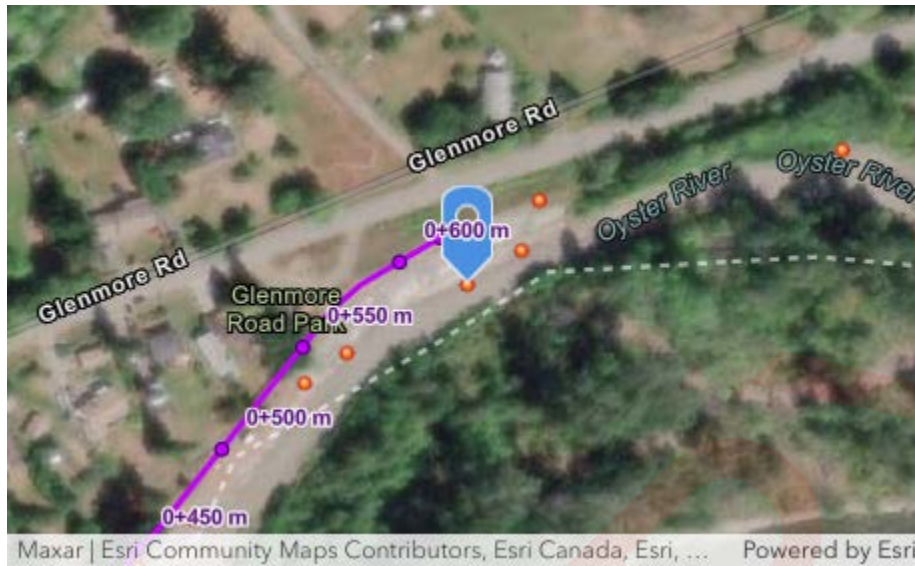
riprap in good condition. some vegetation along toe. old mesnder may be aggrading

Image



3436005_FM_Observations

Point



Notes

dike elevation drops here about 0.5 m. at chainage 620 m. riprap in excellent condition. flood flows will concentrate on toe, area at toe lower than old channel

Image

COPY





COPY

3436005_FM_Observations

Point



Notes

large shrubs small trees along riprap toe.

Image



3436005_FM_Observations

Point



Notes

riprap in excellent condition. gate here. trees on land side of dike. possible transition from older installed riprap to newer riprap (downstream)

Image



3436005_FM_Observations

Point



Notes

riprap in excellent condition. refuse appears to have been dumped on dike (bricks, concrete, mortar). upper portion of dike had soil layer with established grass cover

Image

COPY

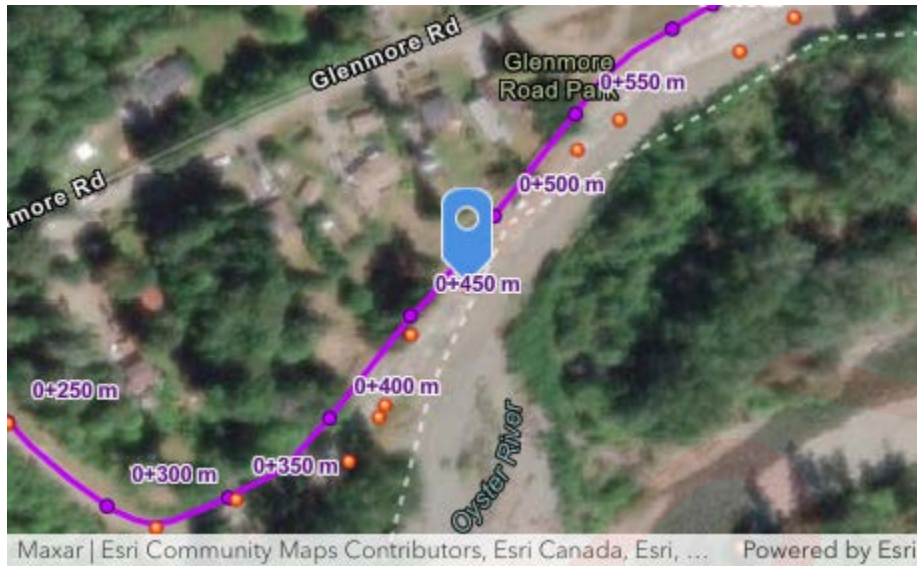




COPY

3436005_FM_Observations

Point



Notes

dike riprap in excellent condition. refuse dumped onto Dike slope (bricks, concrete, garden waste). small concrete stair way here)

Image

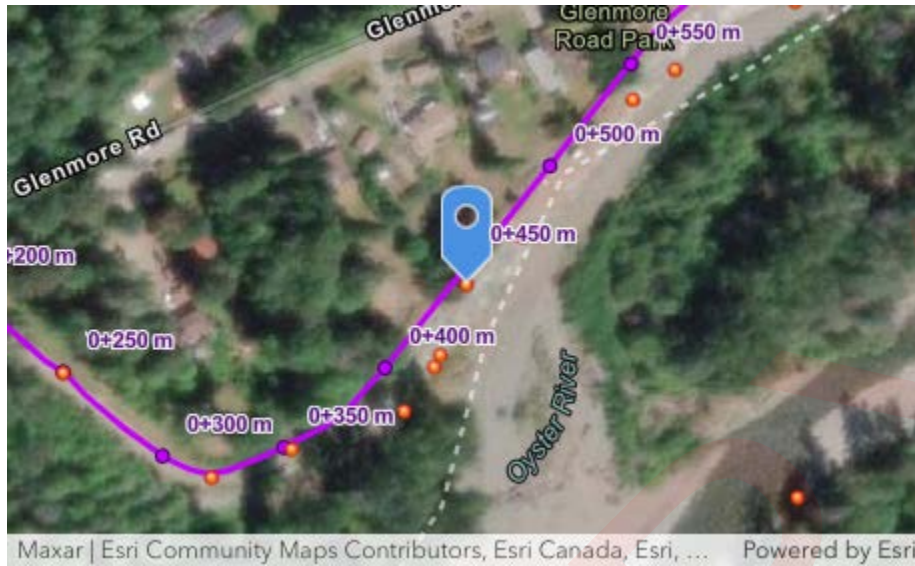
COPY





3436005_FM_Observations

Point



Notes

vegetation and small trees along toe of dike(riverside). riprap in excellent condition

Image



3436005_FM_Observations

Point



Notes

toe in excellent condition

Image



3436005_FM_Observations

Point



Notes

Image

3436005_FM_Observations

Point



Notes

18 inch valve outlet on riverside of dike. riprap in excellent condition

Image



3436005_FM_Observations

Point



Notes

dike almost completely cover with vegetation. no evidence of erosion via water

Image

COPY

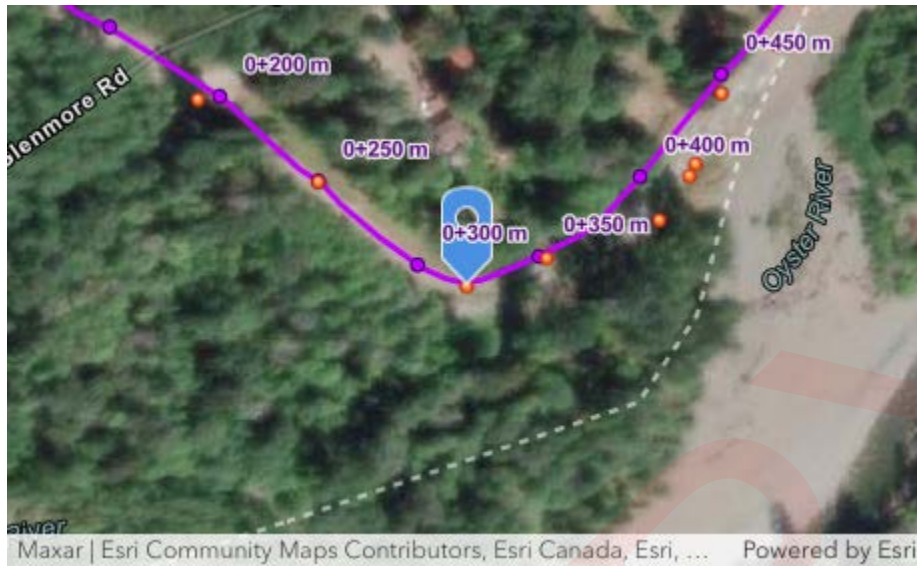




COPY

3436005_FM_Observations

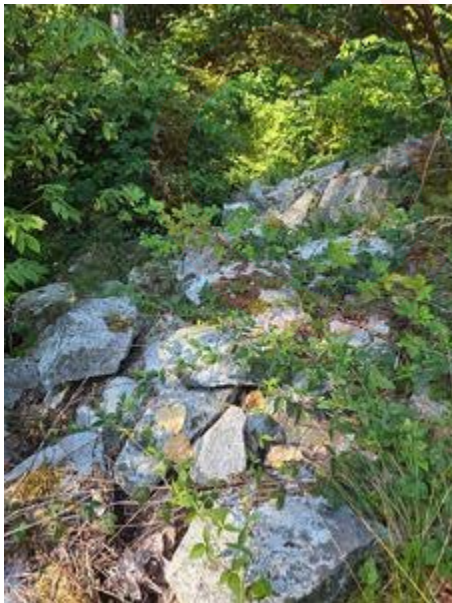
Point



Notes

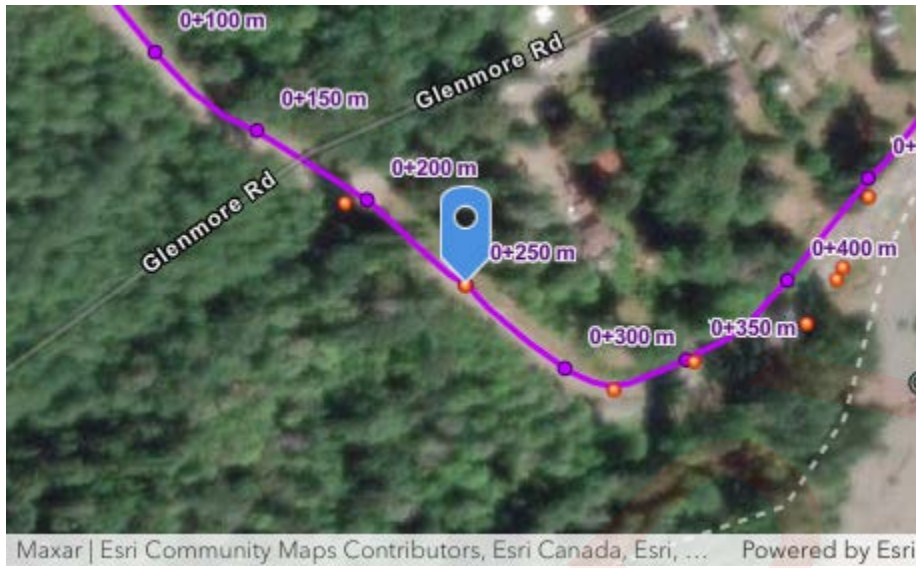
appears to be in good condition. mostly covered in vegetation

Image



3436005_FM_Observations

Point



Notes

good condition dike

Image



3436005_FM_Observations

Point



Notes

dike turns into road

Image

COPY

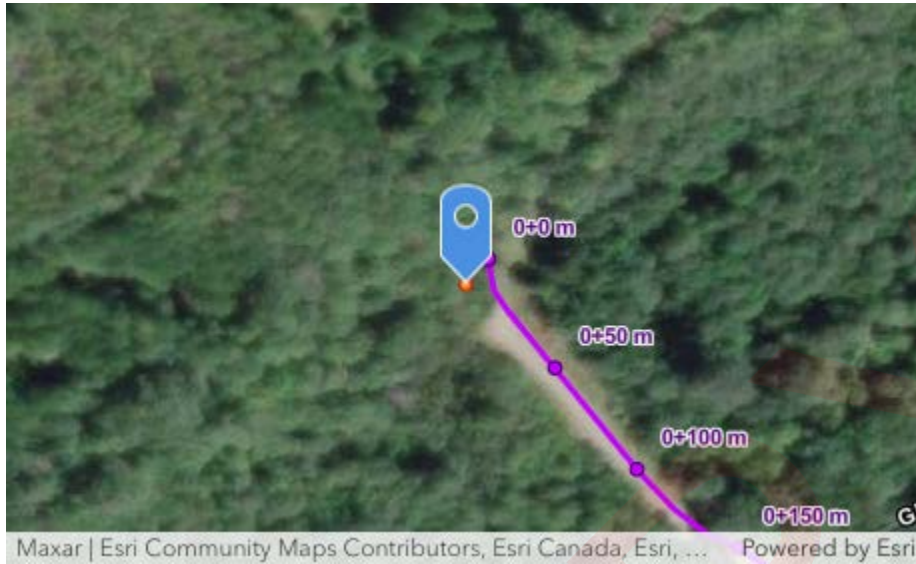




COPY

3436005_FM_Observations

Point



Notes

end of dike, tied into slope, with allowance for road drainage

Image

COPY





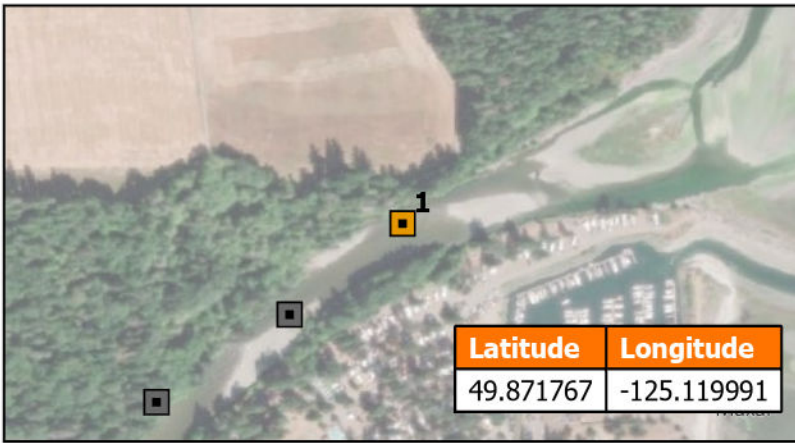
COPY



KERR WOOD LEIDAL
consulting engineers

Survey 123

COPY



Oyster River Bank Inspection

Date of Inspection:	2024-08-15
Inspected By:	Liam Mackle
Contact:	lmackle@kwl.ca

Observation Type	Please provide a description	Material	Dimensions	Crest Elevation	Filter Layer	Please provide a description	Condition Comments
Other	Severely eroded bank, one tree down, one 50% undercut, several others at risk near term						

Observation Photos:





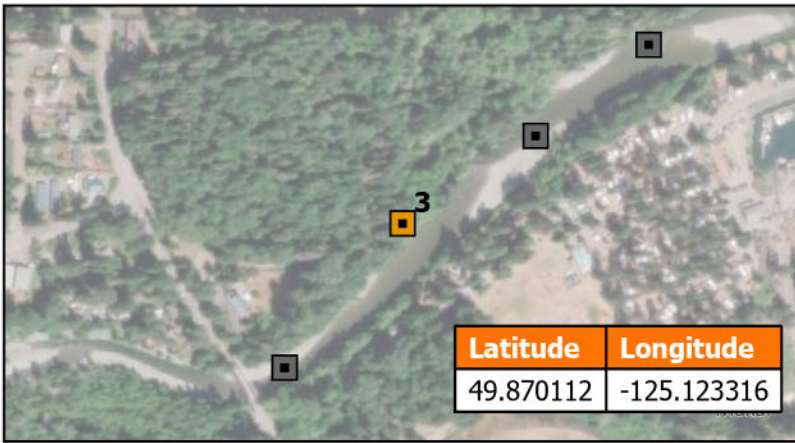
Oyster River Bank Inspection

Date of Inspection:	2024-08-15
Inspected By:	Liam Mackle
Contact:	lmackle@kwl.ca

Observation Type	Please provide a description	Material	Dimensions	Crest Elevation	Filter Layer	Please provide a description	Condition Comments
Other	Down tree spanning entire creek, dia +0.6 m. Bank eroding and undercut						

Observation Photos:





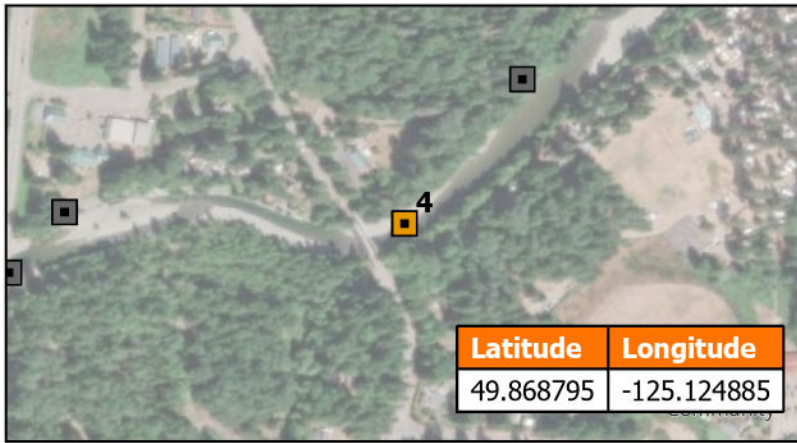
Oyster River Bank Inspection

Date of Inspection:	2024-08-15
Inspected By:	Liam Mackle
Contact:	lmackle@kwl.ca

Observation Type	Please provide a description	Material	Dimensions	Crest Elevation	Filter Layer	Please provide a description	Condition Comments
Other	Riprap windrow (berm?) on left bank. Looks recent, size ranges from 150 mm to 600 mm. Upstream ties into existing old earth berm. Possibly protects wellhead?						

Observation Photos:





Oyster River Bank Inspection

Date of Inspection:	2024-08-15
Inspected By:	Liam Mackle
Contact:	lmackle@kwl.ca

Observation Type	Please provide a description	Material	Dimensions	Crest Elevation	Filter Layer	Please provide a description	Condition Comments
Bank Protection		Rock riprap	Approx 250 of old riprap, extending ds of former rail bridge. Assumed single layer thickness, rock size est d50 500 mm, slope up to 1:1 or steeper at bridge	Top of bank, reducing to half to on ly toe at low bank st ds	Unknown		75, not actively failing but material has been lost over time

Observation Photos:





Oyster River Bank Inspection

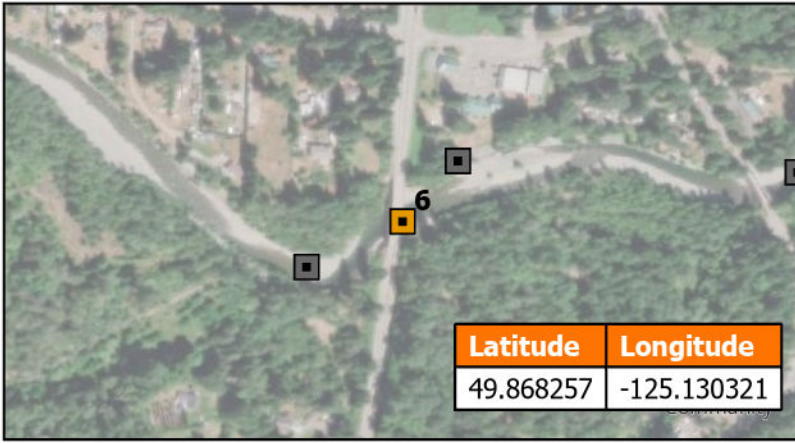
Date of Inspection:	2024-08-15
Inspected By:	Liam Mackle
Contact:	lmackle@kwl.ca

Observation Type	Please provide a description	Material	Dimensions	Crest Elevation	Filter Layer	Please provide a description	Condition Comments
Bank Protection		Rock riprap	Approx 275m length (bridge to bridge nearly), generally 2:1 slope, interlocked well, 750 to 1000 mm d50, smaller at top of slope	Full bank, good coverage	Unknown		90+, generally good condition

Observation Photos:



--	--	--	--



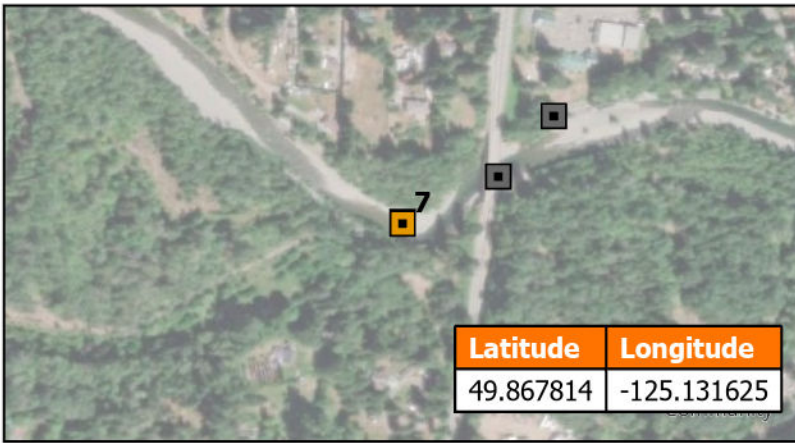
Oyster River Bank Inspection

Date of Inspection:	2024-08-15
Inspected By:	Liam Mackle
Contact:	lmackle@kwl.ca

Observation Type	Please provide a description	Material	Dimensions	Crest Elevation	Filter Layer	Please provide a description	Condition Comments
Other	Out of scope, note that there is no armouring on left bridge abutment at outside bend of river						

Observation Photos:

--	--	--	--



Oyster River Bank Inspection

Date of Inspection:	2024-08-15
Inspected By:	Liam Mackle
Contact:	lmackle@kwl.ca

Observation Type	Please provide a description	Material	Dimensions	Crest Elevation	Filter Layer	Please provide a description	Condition Comments
Bank Protection		Rock riprap	Approx 80m slope 2:1 to 3:1, ties into newer bridge riprap, d50 300-400 mm	Full bank coverage	Unknown		Some larger material in the thalweg at the bridge (could be bridge riprap).90+

Observation Photos:



Latitude	Longitude
49.869783	-125.139307

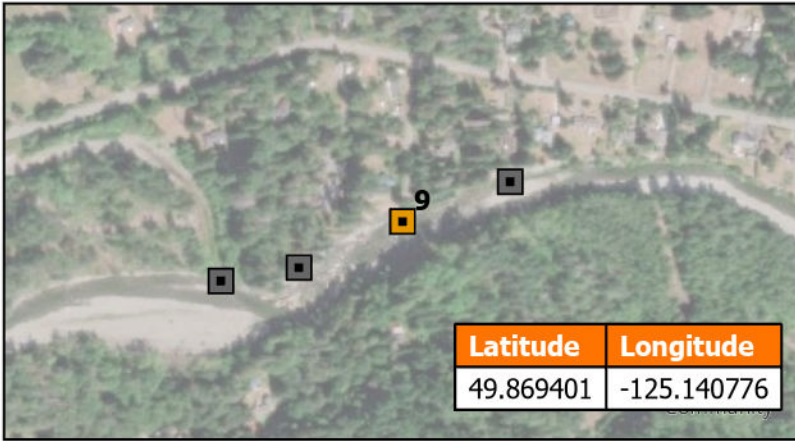
Oyster River Bank Inspection

Date of Inspection:	2024-08-15
Inspected By:	Liam Mackle
Contact:	lmackle@kwl.ca

Observation Type	Please provide a description	Material	Dimensions	Crest Elevation	Filter Layer	Please provide a description	Condition Comments
Bank Protection		Rock riprap	Approx 500m revetment, varying size from 300 to 1200mm, much larger rock at toe, condition varies, visibly old, 1:1 to 1:3 slope	Full bank, thinner cover at upper slope	Unknown		Condition ranges from fair to poor, generally intact for entire length, some undermined areas with bank exposed

Observation Photos:

--	--	--	--



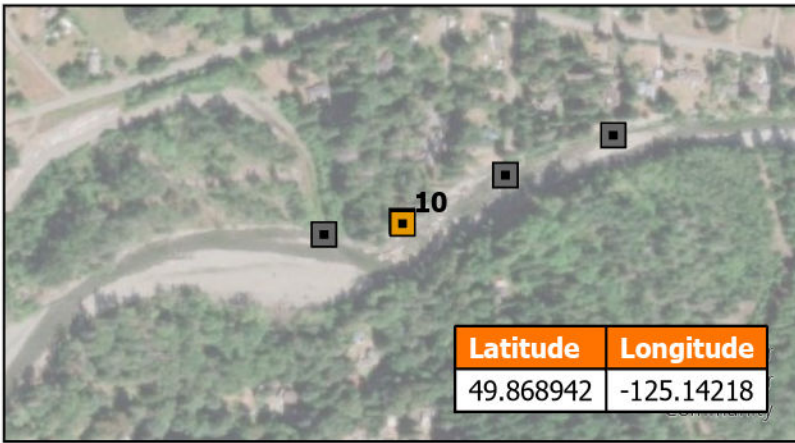
Oyster River Bank Inspection

Date of Inspection:	2024-08-15
Inspected By:	Liam Mackle
Contact:	lmackle@kwl.ca

Observation Type	Please provide a description	Material	Dimensions	Crest Elevation	Filter Layer	Please provide a description	Condition Comments
Other	Tall eroding cutbank of sand/fines						

Observation Photos:

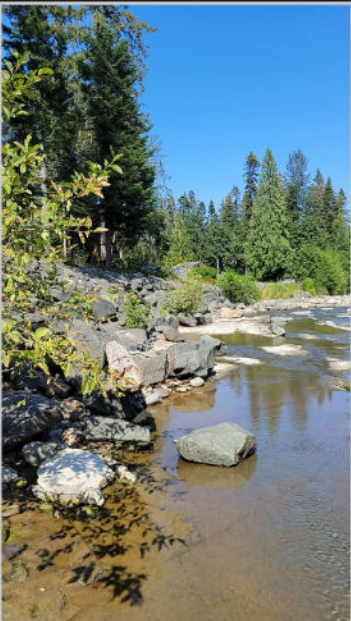


Oyster River Bank Inspection

Date of Inspection:	2024-08-15
Inspected By:	Liam Mackle
Contact:	lmackle@kwl.ca

Observation Type	Please provide a description	Material	Dimensions	Crest Elevation	Filter Layer	Please provide a description	Condition Comments
Bank Protection		Rock riprap	Approx m of 800 mm rock, slope from 2:1 to 1:1, ds section has toe extending out from bank	Full coverage	No		95, good condition, some local loss of toe rocks

Observation Photos:





Oyster River Bank Inspection

Date of Inspection:	2024-08-15
Inspected By:	Liam Mackle
Contact:	lmackle@kwl.ca

Observation Type	Please provide a description	Material	Dimensions	Crest Elevation	Filter Layer	Please provide a description	Condition Comments
Bank Protection		Rock riprap	700 mm + along corner of bank steep 1:1 or greater,	Full bank, 4m approx	Unknown		90

Observation Photos:



KERR WOOD LEIDAL
consulting engineers

Appendix B

Photographs

COPY



Appendix B – Photographs



Photo 1: Established Trees and Vegetation, Especially Himalayan Blackberry, in the Riprap Apron Between Hwy 19a Bridge and Regent Road Bridge (August 7, 2024)



Photo 2: Some Minor Riprap Loss at the Toe of Slope Upstream of Hwy 19a Bridge (August 7, 2024)

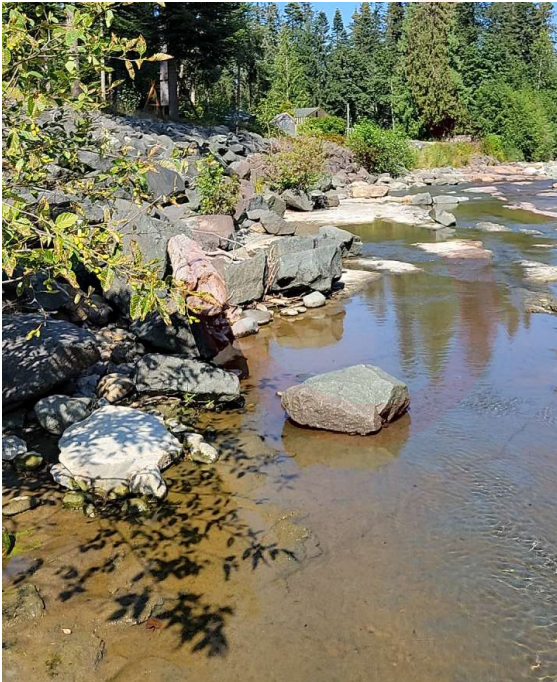


Photo 3: Riprap Apron Over Exposed Bedrock Outcropping at the Upstream Limit of the Assessment Area (August 7, 2024)



Photo 4: Riprap Extending up a Side Channel Towards the Glenmore Dike and into Heavy Vegetation (August 7, 2024)



Appendix B – Photographs



Photo 5: Actively eroding Bank Undercutting Several Mature Trees (August 7, 2024)



Photo 6: Large Fallen tree Spanning the Full Channel Width Removed September 25, 2024 (August 7, 2024)



Photo 7: Log Jam on a Gravel Bar at Oyster River Nature Park (August 7, 2024)



Photo 8: Eroding Silt Bluff on the Right Bank at Lorna Lane (August 7, 2024)



Appendix B – Photographs



Photo 9: The River Runs Over Exposed Bedrock at the Upper Limit of the Assessment Reach (August 7, 2024)



Photo 10: Low Right bank at the Estuary with some Rock Armouring (August 7, 2024)



Photo 11: A Windrow Berm in the Left Floodplain to Protect a Wellhead (August 7, 2024)



Photo 12: Steep and Varied Riprap Showing Some Material Loss on the Right Abutment of the Regent Road Bridge (August 7, 2024)



Appendix B – Photographs



Photo 13: No Bank Armouring and Some Erosion Evident on the Left Abutment of the Hwy 19a Bridge (August 7, 2024)

COPY



STAFF REPORT

DATE: June 21, 2024 **FILE:** 0550 Board

TO: Chair and Directors,
Regional Board

FROM: David Leitch
Chief Administrative Officer

RE: OYSTER RIVER BANK INSPECTION – GRANT OPPORTUNITY

PURPOSE/PROBLEM

To consider the submission of an application to the Provincial Infrastructure Planning Grant Program (IPGP) to partially fund the Oyster Riverbank Inspection.

EXECUTIVE SUMMARY

Due to anticipated synergies and efficiencies, an assessment of the north bank of Oyster River was included as an optional element within Community Services RFP-03-24 Oyster River and Coastal Lands Floodplain Mapping project. The project will focus on a 2 km section of the river, from the Glenmore Dike to Oyster River Park, just downstream of the Regent Road bridge. In response to the river channel movement and a history of regular flooding, the Strathcona Regional District (and its predecessor CSRD) undertook the construction of bank stabilization and flood mitigation measures, including riprap revetments and the Glenmore Dike between 1975 and 2010.

A geomorphic assessment of the Oyster River completed in 2021 noted that the river had cut a meandering valley through the coastal plain sediments in these lower reaches, with evidence of historical river channels and associated deposits across the valley bottom. The assessment also identified that the area to the north of the river, where the Oyster River community is located, is at risk of natural hazards like overland flooding and sudden changes in the river's course.

Through this proposed project, SRD seeks to assess the lower reach of the Oyster River based on geomorphology, flood risk, and long-term stability. Existing bank stabilization and erosion protection measures will be inspected, and any higher-risk areas for erosion potential will be identified as part of the overall river assessment.

The inspection results will provide recommendations for river works, which will be used to create an asset management plan for the SRD. This plan will be used for repairs, inspections, upgrades, and budget planning both now and in the future.

The \$35,000 cost of assessment can be covered through a transfer of reserve from function 790, the Oyster River Bank Protection Service which has a current balance of approximately \$95,000. The IPGP grant, if approved, would cover up to \$10,000 of the estimated \$35,000 cost. Additional grant funding will be pursued, and any successful grants will reduce the amount of reserve funds needed.

RECOMMENDATIONS

1. THAT the report from the Chief Administrative Officer be received.

2. THAT an application to the Infrastructure Planning Grant Program for \$10,000 be submitted to assist with funding to complete the Oyster River and Coastal Lands Riverbank Inspection.
3. THAT the 2024 – 2028 financial plan be amended to include a transfer from reserve of \$35,000 from Function 790 to be used for the Oyster River Bank inspection project.

Respectfully:



Dave Leitch
Chief Administrative Officer

Prepared by *Sheena Fisher., Engineering Services Coordinator*

Attachments: Kerr Wood Liddell Proposal for Riverbank Inspection

COPY

Appendix A

**OPTIONAL
PROPOSAL FOR
RIVERBANK
INSPECTION**



KERR WOOD LEIDAL
consulting engineers

Strathcona Regional District

RFP No. 03-24

OYSTER RIVER AND COASTAL LANDS RIVERBANK INSPECTION

CONTENTS

Relevant Experience.....	1
Project Team	5
Project Understanding.....	6
Methodology And Approach.....	7
Deliverables	8
Assumptions.....	8
Value-Added Services.....	9
Work Plan	10
Budget.....	11
Project Team Résumés	

RELEVANT LOCAL EXPERIENCE

Kerr Wood Leidal Associates Ltd. is a BC-based, employee-owned firm focused on water and water-related planning and infrastructure projects. We provide consulting services in resource and environmental management, infrastructure planning, design and construction, and project administration. The KWL team of approximately 250 staff is located in offices in Burnaby, Victoria, Vernon, Calgary, Nelson, and Whitehorse. Our Victoria office is located on the traditional territories of the Xwsepsum (Esquimalt) and Ləkʷəŋən (Songhees), and W̱SÁNEĆ (Saanich) Peoples.

KWL has worked for Vancouver Island local governments and communities since inception and opened a Victoria office in 2000. Our proposed inspection team is based on Vancouver Island and is composed of passionate, professional local residents who understand the unique engineering and environmental issues of the Island.

KWL's Water Resources Sector specializes in effective water management by assessing watersheds, river and

creek systems, coastlines, and natural hazard risks for a wide range of applications. The skills that our core team offers are built through years of firsthand experience and continued learning. Comprised of seasoned professionals (seniors with 10+ years of experience and experts with 30+ years), we aim to meet or exceed client expectations and regulatory requirements of every project with which we are entrusted.

KWL has successfully undertaken multiple inspection and assessment projects for rivers and associated infrastructure for local governments and First Nations, including initial debris and erosion hazard assessments following the November 2021 Atmospheric River Event flood; inspection and assessment of the Cowichan Tribes 17 km diking system; and bridge scour and erosion for dozens of MoTI owned structures across BC. KWL also completed the latest floodplain mapping on the Oyster River, along with a geomorphological assessment of the river from Highway 19 to the mouth.

Coastal And Oyster River Flood Mapping Project

COMOX VALLEY REGIONAL DISTRICT

Kerr Wood Leidal Associates Ltd. (KWL) led a multi-disciplinary team to prepare flood hazard maps of the entire coastline of the Comox Valley Regional District (CVRD) including Denman and Hornby Islands and the Oyster River downstream of Highway 19. Mapping was prepared for 4 sea level rise scenarios (current, 0.5 m, 1 m, 2 m) and five storm return periods ranging from 10 years to 500 years. A climate change analysis on future changes in precipitation was performed to identify projected changes in the magnitude of peak floods. The project involved developing 1-D/2-D hydraulic models in HEC-RAS and GeoHECRAS of the Oyster and Courtenay Rivers and deep water and nearshore coastal models of the Strait of Georgia. In addition to the comprehensive mapping collected and prepared for this project, KWL conducted a geomorphological assessment on the Oyster River.

The hydraulic modelling and geomorphology assessments carried out by KWL for the Coastal and Oyster River Flood Mapping Project provides us with a thorough understanding of the characteristics and dynamics of the Oyster River within the proposed study area for the Oyster River Bank Protection Inspection. This understanding provides KWL with the opportunity to consider the larger-scale river channel dynamics that may be impacting the local bank protection works.

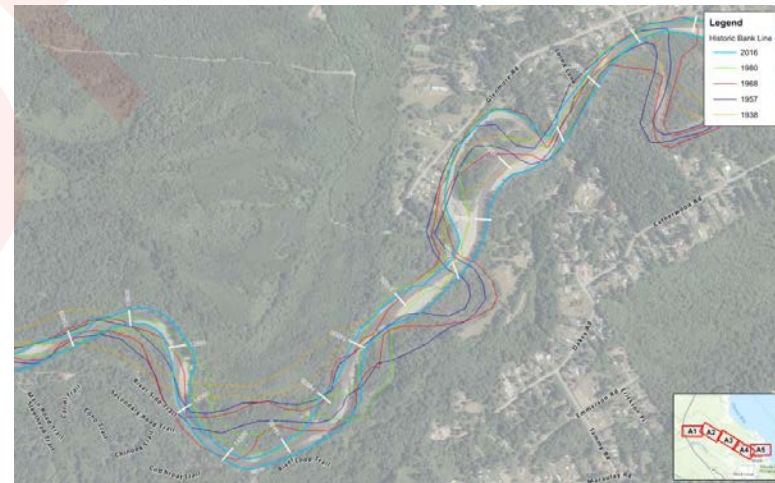






Photo 1: Oyster River Geomorphology Assessment

Quick Facts

 2019-2020	 Comox Valley Regional District Robyn Holme, MCIP, Long Range Planner T: (250) 334-6000 E: rholme@comoxvalleyrd.ca
 \$499,518	
 Eric Morris	

Cowichan Tribes Dike Inspections

COWICHAN TRIBES

Cowichan Tribes retained Kerr Wood Leidal Associates Ltd. (KWL) to complete an assessment of the diking system on the Cowichan IR#1 floodplain areas of the Cowichan and Koksilah Rivers. This project was funded by the Union of British Columbia Municipalities (UBCM) under the Community Emergency Preparedness Fund. The primary objectives of this project were to:

- assess the current condition of the diking and channel erosion protection system;
- create a dike maintenance plan for the diking system; and
- provide recommendations for future studies and capital projects.

The diking system is made up of fifteen individual dikes, with a total length of approximately 17 km, that provide varying levels of protection from river and coastal flood events. Many of these dikes also include riverbank protection measures to protect dikes from channel erosion.

KWL developed a dike inspection record template modelled after the Province of British Columbia’s 2021 Dike Inspection Checklist, which is intended for use by Cowichan Tribes in future dike inspections. KWL inspected and assessed the condition of each dike including riverbank erosion protection measures and completed the dike inspection records for the year 2022.

Maintenance and repair recommendations for the dikes and erosion protection measures were based on the field assessment work. The Dike Maintenance Plan summarized dike maintenance recommendations for areas of concern which are separated into two classifications – Operations and Maintenance (O&M) and Minor Repairs, or Major Repairs.

The Dike Maintenance Plan incorporated hydrotechnical, geotechnical, environmental, and archaeological considerations and aimed to balance protection of the integrity of the dike with important riparian habitat benefits.

The Future Studies and Capital Projects plan outlined additional recommendations for further studies and capital projects for the diking system. This was a forward-looking plan that provided recommendations for long-term dike maintenance, studies, upgrades, and concepts, as well as a capital plan to address issues in the diking system.

KWL maximized our on the ground efficiency by splitting into two separate inspection teams. Conversations with local residents and community elders were an integral part of the background information gathering to gain a holistic

understanding of the dikes as well as the history and importance of the Cowichan and Koksilah Rivers.

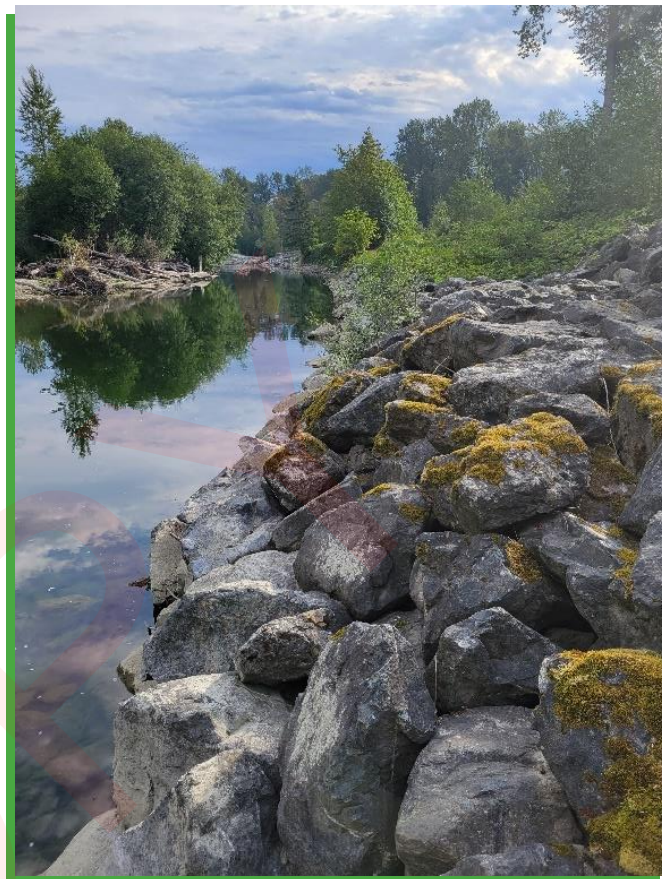






Photo 2: South Side Setback Dike on the Cowichan River

The field data collection tool and template that KWL developed in ArcGIS Survey123 proved invaluable to the efficient and through collection of location data and inventory of the many appurtenant structures.

An extensive field survey of fifteen separate dikes in varying conditions gave keen insight into the importance of regularly scheduled and funded maintenance programs for flood mitigation works.

Quick Facts

	2022-2023	 Cowichan Tribes Alec Johnnie T (250) 748-3196 E Alec.Johnnie@cowichantribes.com
	\$140,256	
	Craig Sutherland Liam Mackle	

Chemainus River November 2021 Atmospheric River Event Emergency Recovery and Mitigation

BC MINISTRY OF ENVIRONMENT & CLIMATE CHANGE STRATEGY - ENVIRONMENTAL PROTECTION DIVISION

Kerr Wood Leidal is working with the Ministry of Environment and Climate Change Strategy (MECCS) to assess and address the impacts of flooding resulting introduced during the 2021 Atmospheric River Event (ARE). Funding by the Province of British Columbia was approved to aid in several recovery projects along the Chemainus River over three years.

The scope of the multi-year flood recovery project works includes:

- Sediment management to removal gravel accumulated along the Chemainus River from the Chemainus Road bridge upstream to 50 m east of the E&N Railway bridge.
- Design and construction of approximately 860 m of temporary flood barrier downstream of the Highway 1 bridge and into Halalt Nation.
- Design and construction of bendway weirs as bank protection measures along the actively eroding right bank of the river downstream of the Highway 1 bridge.

KWL produced designs and worked under a rigorous construction schedule to design and enact flood mitigation measures annually within the regulatory instream construction window but also before the onset of flood season. The projects also had to consider how interim flood mitigation works and riverbank erosion protection would complement planned longer-term mitigation plans along the entire Chemainus River floodplain.

The project involved active coordination and engagement with the province, municipalities, regulators, First Nations, and private landowners. As work occurred in the river and floodplain there were also several environmental and archaeological factors and considerations that needed to be incorporated into the designs.



Photo 3: Chemainus River Under Major Flooding During November 2021 ARE

Quick Facts

	2022-Ongoing	 BC Ministry of Environment & Climate Change Strategy - Environmental Protection Division Alice Vinden T (250) 387-6121 E alice.vinden@gov.bc.ca
	\$558, 825	
	Craig Sutherland Liam Mackle Chad Davey	

Scour Evaluation of Spread Footing Structures - Highway 3

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE

The Ministry of Transportation and Infrastructure (MoTI) prioritized scour evaluations for structures founded on spread footings along the major highway corridors in BC. KWL was assigned to undertake scour evaluations of 24 structures along the Highway 3 corridor from Hope to the Alberta border.

The scope included the preliminary scour evaluation of 24 structures, detailed scour evaluations of all highly susceptible and critically susceptible structures, and preparation of conceptual scour and erosion mitigation designs and order of magnitude/comparative (Class D) cost estimates for structures identified as a top priority for remediation to be advanced to 100% complete detailed design.

Two teams of experienced field inspection staff undertook these evaluations in September 2023, identifying eleven high risk structures, and advancing two sites to detailed design. Field data was collected using ArcGIS Survey 123 forms developed specifically for bridge scour and erosion inspections. This simplified the management of large amounts of data collected from the 24 sites and provided a means to provide immediate uploading/backup of important field data

High risk sites were surveyed and assessed using hydraulic models for scour risk and potential flood impacts. This also informed the design of proposed erosion mitigation strategies and other bridge protection or upgrade measures.

KWL used a ranking system to evaluate each bridge that included assessments of local river conditions and existing bank protection infrastructure, but also zoomed out to consider reach and watershed wide factors that can contribute to erosion and scour risk at these critical crossings.

This work built upon assessments that KWL completed in previous years for MoTI across Northern BC and allowed us to further hone our assessment skills and team.



Photo 4: Bridge Inspection on Highway 3 over the Similkameen River

Quick Facts

	2023-Ongoing	 Ministry of Transportation and Infrastructure Alysha Piccini T (778) 220-4734 E alysha.piccini@gov.bc.ca
	\$299,578	
	Craig Sutherland Liam Mackle Chad Davey	

PROJECT TEAM

Team members selected for this project have extensive local and BC wide experience in river inspections. The following pages describe each key personnel's qualifications in delivering the Riverbank Inspection for the SRD. Detailed resumes showcasing our team's expertise are included at the end of this document.

Eric Morris, M.A.Sc., P.Eng.

PROJECT MANAGER



Eric is a Principal of KWL and a senior hydrotechnical engineer with over 20 years of experience specializing in coastal engineering and municipal infrastructure planning and design. To date, he has managed over 119 projects with KWL and has led many technical and complex projects for different municipalities in British Columbia. Eric's coastal engineering expertise includes modelling of water flows due to tides and wave action, preparation of floodplain mapping and risk assessments, master planning and development of capital plans and climate change adaptation plans, coastal erosion assessments, and design of shoreline erosion protection including nature-based solutions.

Eric will be project manager for the Oyster River and Coastal Lands Floodplain Mapping Project and will manage the Riverbank Inspection team for efficiency.

Craig Sutherland, M.Sc., P.Eng.

TECHNICAL REVIEW



Craig has over 20 years of experience in water resource engineering and consulting. He has broad experience in water resources projects including planning, design, and construction management.

Craig has managed river and coastal erosion/flood protection projects, including marine and fluvial aquatic habitat protection measures and enhancement projects. For these projects, he has been responsible for initial assessments, conceptual planning, detailed design, liaison with regulatory agencies for approvals, tendering, construction inspection, contract management, project completion and on-going post construction maintenance/monitoring.

Craig's strength lies in his ability to work collaboratively in multidisciplinary teams with fisheries biologists, riparian ecologists, geomorphologist and other professionals to incorporate engineering design into riverbank protection, natural stream processes and riparian/aquatic habitat improvements. With his excellent communication skills, Craig brings his technical expertise and knowledge to work with communities and stakeholders to balance risk to the community from flood and erosion hazards with protection of important aquatic habitat.

Liam Mackle, P.Eng.

RIVER ASSESSMENT LEAD



Liam is a professional Water Resources Engineer with 10 years of consulting experience specializing in riverine and hydrotechnical engineering. He excels in public facing roles as a project manager or client liaison, and his technical proficiencies

span from engineering design to field engineering and construction monitoring. He has overseen the successful design and implementation of projects across Western Canada for a variety of clients in both the public and private sectors. His experience conducting on the ground inspections and assessments includes erosion assessment, infrastructure such as dams and bridges and condition assessments of 17 kilometers of dikes.

Chad Davey, B.A., M.Sc., R.P.Bio., P.Biol.

FLUVIAL GEOMORPHOLOGY LEAD



Chad is an experienced fluvial geomorphologist and aquatic biologist with an understanding of river channel morphology and its influence on the spatial organization of fish habitat. Chad has extensive experience with interpreting

morphological processes in fluvial, periglacial, and permafrost dominated landscapes, and mapping salmonid habitat in rivers and lakes. Chad has vast experience in aerial photo interpretation, channel stability analyses, collection of stream flow data, installation of hydrometric stations, and terrain analysis in Alberta, BC, Yukon, and Northwest Territories. As a registered professional biologist, Chad has completed several aquatic effects assessments for various constructions projects within stream channels and intertidal areas.

Grace Nijdam, B.A., ADP

GIS ANALYST



Grace has a bachelor's degree in Geography from the University of British Columbia, as well as an Advanced Diploma in GIS from the British Columbia Institute of Technology. Prior to joining

KWL, Grace worked as a GIS Analyst for Esri Canada, where she provided technical support for desktop, cloud, and enterprise products, as well as building custom tools and applications. Her background in geography emphasized the environment and sustainability, which informs practical applications of GIS to a variety of projects.

PROJECT UNDERSTANDING

The headwaters of the Oyster River begin along the western flank of Mt. Washington and flow north eastward before flowing across the coastal plain and entering the Strait of Georgia along the East Coast of Vancouver Island. The river reach of interest for this project comprises the approximately 2 km of river along the most downstream reaches, from the GlenmoreDike to Oyster River Park immediately downstream of the Regent Road bridge. In response to the river morphodynamics (river channel movement) and a history of regular flooding, SRD undertook construction of bank stabilization and flood mitigation measures including riprap revetments and the GlenmoreDike between 1975 and 2010.

KWL completed a geomorphic assessment of the Oyster River in 2021 and noted that the river has cut a meandering valley through the coastal plain sediments in these lower reaches, with evidence of historical river channels and associated deposits across the valley bottom. The assessment also identified that the area to the north of the river, where the Oyster River community is located, is an alluvial fan hazard area that could be subject to hazards such as overland flow and channel avulsion.

Through this proposed project, SRD seeks to assess the lower reach of the Oyster River through a lens of geomorphology, flood risk, and long-term stability. Existing bank stabilization and erosion protection measures will be inspected, and any higher risk areas for erosion potential will be identified as part of the overall river assessment. The inspection results are not only a series of recommendations for river works, but will also form part of the development of an asset management tool for the SRD to use for repairs, inspections, upgrades, and associated budget planning now and into the future. This work will also complement and inform the Coastal Lands Floodplain Mapping primary scope of work as outlined in RFP-03-24. KWL understands that current flood protection infrastructure maintenance funding is potentially limited to \$8,350 annually as per Oyster River Flood Protection Service (Bylaw No. 457). With that in mind, KWL will seek to

identify potential grants or other funding streams where possible as part of any upgrade recommendations resulting from the inspection.



KWL previously completed a hydrologic assessment and a combined 1D/2D hydraulic model of the Oyster River in 2021, and has extensive experience and familiarity with the river system and local watersheds. This includes an understanding of areas prone to overland flooding, erosion potential hotspots, alluvial fan hazard and the adjacent infrastructure such as bridges and buildings. Additionally, we are aware that some of the stabilization measures through the reach of interest are on private property, so inspection and access plans will require consideration of the affected property owners. We will leverage this knowledge and experience to deliver an actionable riverbank inspection that meets SRD's needs now and into the future.

METHODOLOGY AND APPROACH

The comprehensive river inspection plan will identify potential existing issues, inform the development of updated flood hazard mapping, and enable the SRD to prioritize and plan for future maintenance and capital works through the following tasks:

PROJECT MANAGEMENT

The project will be managed by the same project manager that is managing the Oyster River and Coastal Lands Floodplain Mapping Project – Eric Morris. KWL’s project management approach and systems are outlined in the proposal for the Oyster River and Coastal Lands Floodplain Mapping Project.

OYSTER RIVER CHANNEL AND RIVERBANK ASSESSMENT

The assessment will begin as a desktop exercise before the field inspection begins. Existing background data will be reviewed including flood mapping, geomorphology studies, as-builts of constructed works, and other available information. SRD staff will also be consulted to give input on existing works and river observations. This will allow our team to identify any potential flood risk areas or erosion hotspots in advance of field work while furthering our understanding of this reach of river. Our geomorphologist will also review the previously completed meander belt assessment and compare it to recent aerial imagery to identify any changes to channel form that have occurred in the last 4-5 years.

Field inspection procedures will be based on methods described in the Flood Protection Works Inspection Guide (BC Water Management Branch, March 2000), as well as built upon experience gained from other inspection programs completed. KWL has previously developed a field data collection program using ArcGIS Survey123 that will be updated and adapted for use in this assessment. The program allows for efficient data collection of predetermined categories or parameters by using a tablet in the field. The program combines field notes with location markers and photographs to identify and itemize a wide range of field observations. This tool also follows the suggested methods of the Province of British Columbia’s 2021 Dike Inspection Checklist that we will use during our assessment of the Glenmore dike as described in the Value-Added section. Finally, the ArcGIS Survey 123 tool provides a means to efficiently manage large amounts of data collected in the field in a GIS database which combines metadata, data and location information in a single digital archive. This database is fully compatible with ESRI GIS products allowing easy access and analysis.

We have also proposed that SRD staff be included in the inspection to discuss changes in condition of erosion protection works over the long term and as a learning opportunity to share our assessment methods and demonstrate our field collection program so it can be

adapted by SRD field staff for future inspections. This is described further in the Value-Added section.

REMEDICATION AND RECOMMENDATIONS REPORTING

The results of the field inspection and river inspection will be exported from Survey123 and the data and photographs will be appended as part of the report. The main body of the report will describe the observations and any proposed remediations, upgrades or recommended construction works. These works will be ranked by priority, urgency (recommended timeframe), and costs. The Class D cost estimates will be based on unit prices, production rates and crew rates that reflect KWL’s recent experience with similar work, and therefore represent the best prediction of actual costs as of the date prepared. For capital planning purposes, recommended future work costs will be escalated to account for inflation and other compounding factors.

Inspection timing recommendations will also be made through this reporting. In general, dike inspections should be carried out annually and following any major flood or rainfall events. An inspection schedule for other river stabilization works will be developed following the field inspection and in response to its findings.

Recommendations for upgrades or other expenditures will be made in consideration of the available maintenance budget outlined in Bylaw No. 457. Any recommendations for major capital works or expenses may require grants or external funding, so KWL will provide potential grant options and guidance where possible, and as needed.

All of these findings and recommendations will form the basis of an asset inventory and management tool that can be used by the SRD to track, plan, and budget for maintenance and upgrades of current stabilization and flood mitigation works. If desired, KWL can also provide the field data collected in ArcGIS database format produced by the Survey123 tool.

We will also supplement the findings and recommendations of any relevant sections in the Oyster River and Coastal Lands Floodplain Mapping report.

POTENTIAL EROSION PROTECTION UPGRADES

This project scope will include high-level conceptual modifications or designs of recommended works or upgrades that can be incorporated into the Oyster River model to assess potential impacts on flood levels and inform future planning decisions. These changes will be overseen by our technical reviewer and optimized to reduce footprint and flood level impacts.

The Riverbank Inspection team will collaborate with the Floodplain Mapping team to provide discuss potential erosion protection upgrades and how these should be incorporated into the Oyster River hydraulic model and modelled as a stand-alone task, separate from the Oyster River floodplain mapping scope. KWL will collaborate with the SRD to identify a total of three updated Oyster River hydraulic model runs (three total between the Floodplain Mapping scope and the Riverbank Inspection scope) from some combination of:

- updating model to add potential erosion protection upgrade options; or
- updating model boundary conditions (select an alternate return period/AEP flow rate from previous extreme value analysis.

A figure will be produced communicating the results of these potential erosion protection upgrades, which can be used as an infrastructure planning tool.

Deliverables

KWL will provide the following deliverables as part of this project.

- Figures communicating the results of potential erosion protection upgrades (up to three figures, one for each model run).
- Cost estimate for potential erosion protection upgrades.
- Draft inspection, remediation and recommendations report.
- Final inspection, remediation and recommendations report.

Assumptions

The following assumptions have been used in the development of this proposal and work plan for the purposes of budgeting.

- No updated bathymetry or topographical survey collection is included as part of this scope.
- The river assessment does not include topographic survey. Proposed works and quantities used for cost estimates will be based on field measurements (lengths and slopes) and area takeoffs from available mapping.
- SRD will coordinate access permissions for stabilization works on private property.
- Inspections will occur in late summer (July/August) when river levels are low to maximize visible areas for inspection and ease of access. We recognize that this timing also coincides with full vegetation density which could hinder sightlines and access at some locations. We have experience managing these conditions and will plan accordingly.
- All erosion protection infrastructure on the north side of the lower reach belongs to SRD and falls under the scope of this assessment.
- Engagement with local First Nations is not included in this scope, however First Nation input may be sought out for the stakeholder consultation portion of background data collection for the field assessment.

Any of these items can be discussed during project initiation and changed as required to meet SRD's needs.

VALUE-ADDED SERVICES

Our proposal offers a specialized team of experts in hydrotechnical engineering and geomorphology who have identified the following value-added factors that exceed the scope described in the RFP. t. These value-added services will be discussed with SRD during project initiation and if desired, can be included in the scope without requiring additional budget.

Glenmore Dike Inspection

Our field inspection team has inspected several kilometers of dikes in conditions ranging from new construction to neglected and breached in multiple locations. We have included an inspection of the Glenmore Dike as part of our work plan and inspection template. This effort can supplement or meet the recommended annual dike inspection and form a more robust understanding and assessment of flood protection measures in the lower reach.

ArcGIS Survey123 Inspection Template and Database

KWL developed a field inspection template in ArcGIS Survey123 as part of previous dike inspection projects. We propose a repurposing of that tool for this project for collection of data, location markers, and photographs using a tablet in the field. This also allows for preplanning of parameters, structures, or locations to be inspected. Our template is available to be shared with SRD upon completion of the project for consistency in future inspections and assessments. The raw data collected in Survey123 during the inspections (locations, notes, photos, etc.) are stored in a GIS database that will be provided to SRD at the completion of the assessment.

SRD Staff Training

Our workplan includes two days to carry out the river assessment and we recommend that SRD send appropriate field staff to join the second day of inspections to provide opportunity for KWL staff to better understand any important past observations or conditions. As part of the inspections, KWL staff will be available to provide field training or answer any questions regarding riverbank or dike inspection requirements or methodologies. Production of training materials or “in-class” training sessions are not included in this value-added service.

Grants and Funding Streams for Proposed Works

KWL has in-house experts in grant identification and applications. We have offered their services to explore potential funding streams for any major or long-term remediation recommendations that come out of the field assessment.

Coastal Floodplain Mapping Team Synergy

This proposal and workplan has been structured to be carried out in conjunction with the work and effort being undertaken under the main Oyster River and Coastal Lands Floodplain Mapping scope. We have strived to eliminate any overlapping effort between the Floodplain mapping scope and the riverbank inspection scope.

The floodplain mapping and riverbank inspections will be carried out by separate project teams, both with local experience, so that both project scopes can be conducted simultaneously. Some of the proposed tasks, such as hydraulic modeling, are included in the floodplain mapping scope and will be coordinated with the team carrying out the primary scope of work.

Although each project team will have a technical lead, a single KWL project manager will oversee both projects to provide seamless coordination between the two project teams and to provide a single point of contact between SRD Staff and KWL Staff. The main effort for the project management task is apportioned to the main Coastal Floodplain Mapping scope, with a small number of hours given to the same Project Manager to coordinate this inspection team.

WORK PLAN

PHASE/ TASK	TASK NAME	TASK DESCRIPTION
A	Project Management	
A-01	Project Management and Staff Coordination	<ul style="list-style-type: none"> Monitoring of budget and monthly invoicing. Monthly project update reporting. Coordination between Riverbank Inspection and Floodplain Mapping teams. Proposed PM scope is minimal as it is generally included as part of the Coastal Floodplain Mapping project.
A-02	Meetings	<ul style="list-style-type: none"> Includes project initiation and internal project coordination.
B	River Channel Erosion Hazard Assessment	
B-01	Background Data Review	<ul style="list-style-type: none"> Data inventory, floodplain mapping review, geomorphology review, erosion risk areas, as-builts, client and riverside landowner input.
B-02	Geomorphology Assessment Update	<ul style="list-style-type: none"> Update to the previously completed meander belt assessment for the lower reach.
B-03	Onsite Inspection	<ul style="list-style-type: none"> Two-day inspection of the Oyster River, Glenmore dike, north bank remediation measures, and other identified areas/infrastructure.
C	Reporting	
C-01	Draft Remediation and Recommendations Report	<ul style="list-style-type: none"> Summary report outlining the findings of the onsite inspection and subsequent recommendations with associated urgency and priority rankings. Assume one round of review and feedback by SRD.
C-02	Concept Development and Cost Estimate	<ul style="list-style-type: none"> Conceptual figures and Class D cost estimates for proposed mitigation works.
C-03	Final Remediation and Recommendations Report	<ul style="list-style-type: none"> Finalized document, figures, and cost estimates incorporating SRD review feedback. Includes relevant team members attendance at the final report review meeting.
C-04	Presentation and Communication Materials	<ul style="list-style-type: none"> Coordination with the Coastal Floodplain Mapping team to produce Oyster River Assessment presentation materials and figures to be shared at the regular board meeting.
D	Coordination with Floodplain Mapping Team on the Oyster River Potential Erosion Protection Upgrades Modelling and Report Figure	
D-01	Coordination and Data Sharing with Floodplain Mapping Team	<ul style="list-style-type: none"> Coordination and data sharing of potential erosion protection upgrades as informed by the Riverbank Inspection work. This work will be incorporated into Phase E of the Floodplain Mapping scope of work (under separate proposal cover).
D-02	Coordination on the Oyster River Potential Erosion Protection Upgrades Modelling and Report Figure	<ul style="list-style-type: none"> Provide input and review to the Oyster River Potential Erosion Protection Upgrades modelling and figure (if required).
D-03	Coordination on the Floodplain Mapping Report	<ul style="list-style-type: none"> Provide input and review to relevant sections of the final Floodplain Mapping report.

Detailed Estimated Level of Effort and Fees

Phase/ Task	Task Description	Estimated Hours (Hourly Rate)						Subtotals		Expenses (KWL)	Totals
		Project Maanger	Technical Review	River Assessment Lead	Fluvial Geomorphology Lead	GIS	Project Assistant	Hours (KWL)	Fees (KWL)		
		E. Morris 277	C. Sutherland 243	L. Mackle 178	C. Davey 189	G. Nijdam 143	A. Herd 97				
A Project Management											
A-01	Project Management and Staff Coordination	2	1	6	0	0	1	10	\$1,962	\$0	\$1,962.00
A-02	Meetings	0	1	6	1	0	1	9	\$1,597	\$0	\$1,597.00
Sub-total		2	2	12	1	0	2	19	\$3,559	\$0	\$3,559.00
B River Channel Erosion Hazard Assessment											
B-01	Background Data Review	0	1	2	2	0	0	5	\$977	\$0	\$977.00
B-02	Geomorphology Assessment Update	0	1	0	4	0	0	5	\$999	\$0	\$999.00
B-03	Onsite Inspection	0	0	20	20	0	0	40	\$7,340	\$1,500	\$8,840.00
Sub-total		0	2	22	26	0	0	50	\$9,316	\$1,500	\$10,816.00
C Reporting											
C-01	Draft Remediation and Recommendations Reporting	0	2	16	4	12	2	36	\$6,000	\$0	\$6,000.00
C-02	Concept Development and Cost Estimate	0	1	12	0	8	0	21	\$3,523	\$0	\$3,523.00
C-03	Final Remediation and Recommendations Reporting	0	2	8	3	4	1	18	\$3,146	\$0	\$3,146.00
C-04	Presentation	0	1	4	3	8	1	17	\$2,763	\$0	\$2,763.00
Sub-total		0	6	40	10	32	4	92	\$15,432	\$0	\$15,432.00
D Flood Hazard Mapping											
D-01	Coordination and Data Sharing with Floodplain Mapping Team	0	2	3	2	0	0	7	\$1,398	\$0	\$1,398.00
D-02	Coordination on the Oyster River Potential Erosion Protection Upgrades Modelling and Report Figure	0	2	1	1	0	0	4	\$853	\$0	\$853.00
D-03	Coordination on the Floodplain Mapping Report	0	4	6	4	0	0	14	\$2,796	\$0	\$2,796.00
Sub-total		0	8	10	7	0	0	25	\$5,047	\$0	\$5,047.00
Project Sub-Total		2	18	84	44	32	6	186	\$33,354	\$1,500	\$34,854