

FREP Riparian Update

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Coastal Small Streams BMP project

- Objective was to examine effectiveness of various riparian treatments and practices around streams $\leq 3\text{m}$ in channel width.
- Most of the sites had been suggested by companies that had implemented practices specifically to protect streams (full or partial retention, MFZ, fall and yard away, high stumping, hand cleaning, designated yarding and/or access corridors, etc)
- 70 sites were selected; 17 assessments were completed (all VI).
- All sites were logged using ground-based methods.



Impacts: Lack of root system, LWD Supply and shade

- Density of second growth forests = lack of deciduous trees, understory/shrub layers.
- Prescription only to “retain non-merch and MFZs” may not be good enough in these areas.
- Harvesting all merchantable riparian timber can leave a root system that is not adequate to maintain bank stability and not enough timber is left behind to provide shade and LWD over mid-term.



Interior (block is on right)



Coast (non-merch retention)

Coast (full retention)



Impacts: Channel bed and bank disturbance



Impacts: Introduction of fine sediment to channel



Impacts:

In-stream LWD, Loss of Connectivity



- Yarding across or near streams leaves broken pieces in the channel.
- Large quantities of unstable wood cause blockages and erosion.
- Blockages can cause build up of sediments
- Prevents access by fish
- Impedes delivery of water, nutrients, invertebrates to downstream fish-bearing waters

Project Results

- 9 out of the 17 sites were assessed as either NPF or FHR.
- 47% in the top 2 categories; only 1 site was PFC.

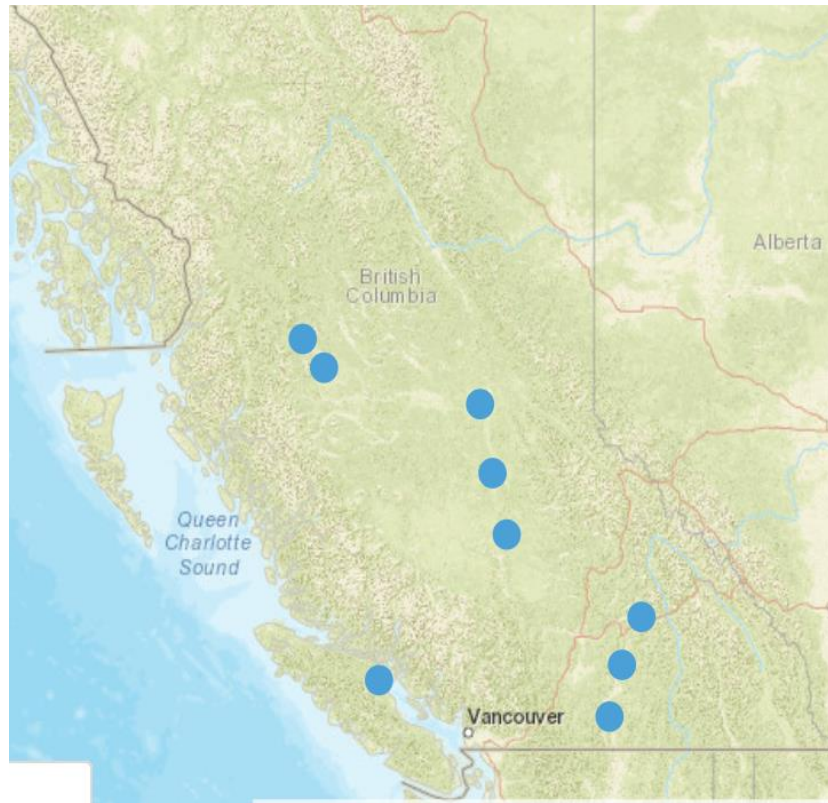
Table 1: Summary listing of streams visited and outcomes

District	Sample ID	Riparian Class	BMP	Road Upstream	# of No's
NICC	1418	S3	Full Reserve FA/YA	Yes	7 NO
NICC	1409	S6	FA/YA, RS, MFZ	Yes	6 NO
NICC	1412	S6	FA/YA, RS, MFZ	Yes	9 NO
NICC	1413	S4	FA/YA, RS, MFZ	Yes	4 NO
NICC	1419	S4	FA/YA, RS, HC	Yes	3 NO
NICC	1380	S4	FA/YA, RS, MFZ	Yes	2 NO
NICC	1420	S4	FA/YA, RS, MFZ	Yes	3 NO
DSI	1508	S6	FA/YA, RS, MFZ, DC	No	5 NO
DSI	1510	S6	FA/YA, RS, MFZ, DC	Yes	3 NO
DSI	1513	S6	FA/YA, RS, MFZ	No	5 NO
DSI	1514	S6	FA/YA, RS, MFZ	Yes	5 NO
DSI	1502	S6	FA/YA, RS, MFZ	Yes	4 NO
DSI	1502A	S6	FA/YA, RS, MFZ	Yes	4 NO
DSI	1601	S6	FA/YA, RS, MFZ	Yes	6 NO
DSI	1602	S6	FA/YA, RS, MFZ	Yes	7 NO
DSI	1519	S6	FA/YA, RS, MFZ	No	5 NO
DSI	1529	S6	FA/YA, RS, MFZ, DC	No	4 NO

BMP Codes: FA/YA = fall away and yard away; RS = Retain saplings & non-merch; MFZ = 5m machine free zone; DC = designated crossing

Face to face discussions about strategies (Riparian roadshow)

- WFP
- Interfor
- Timberwest
- BCTS
- Tolko
- West Fraser
- Canfor
- Lousiana Pacific
- Weyerhaeuser



- Campbell River
- Prince George
- Vernon
- Quesnel
- Williams Lake
- Smithers
- Houston
- Malakwa
- Princeton

Common strategies of licensees with good results.....

- Employ layout crews with knowledge and experience with reading terrain and buffering sensitive areas (including NCDs). This results in variable retention unique and specific to each reach.
- Involve other departments (silviculture) in block layout stage.
- Have senior staff communicate with operations the importance of minimizing disturbance in the riparian area and encourage monitoring during harvesting.
- Provide training in working around streams, minimizing disturbance on erodible soils, working on steep slopes, and providing windfirm buffers.
- Consider timing and methods for different areas to minimize ground disturbance.

FREP

EXTENSION NOTE #41

December 2017

Suggestions for FREP

- Recognize that fine sediments are naturally above threshold values in glacial lacustrine/glacial fluvial areas; moss is naturally found in low quantities in much of these same areas.
 - Protocol adjusted to include N/A option for Q7 & Q8 (N/A does not apply when fines are excessive).
- Recent wood introduced to the channel is not an impact.
 - Revised methodology for assessing LWD in the channel (must be stable, functional, and not a blockage).
- Invertebrate numbers are too variable to be a good indicator
 - Protocol adjusted to include N/A option when water conditions are too high for effective sampling.

Suggestions for FREP

- Need more confidence in the specific activity that is causing impacts.
- What is happening upstream?
 - Included office review of upstream activities in protocol.

FREP

FOREST AND RANGE EVALUATION PROGRAM

Field Supplement to

Evaluating the Condition of Streams and Riparian Management Areas

(Riparian Management Routine Effectiveness Evaluation)

Version 4.0

October 2017





Recommended Steps for a Riparian Evaluation

STEP 1 – Conduct an office review of the potential sample reach area before going out into the field to identify any upstream activities that may contribute to the determination of the causal factors. Useful GIS layers include topographic information (to delineate the drainage area upstream of sample reach), tenure boundaries (range, aggregate, recreation, utilities, etc.), cutblocks, and road crossings. Imagery will also be useful to identify any mass wasting that may have occurred.

To provide the information needed on page 1 of the assessment about upstream development, define the drainage basin that is upstream of the lower end of the sample reach and estimate the percent that has been developed. You can use the tools provided in ArcGIS, Google Earth, or a georeferenced pdf to draw polygons and calculate the areas of both the watershed and the development to help estimate this value. Include road right-of-ways, agriculture pastures, existing cutblocks, transmission lines, and any other man-made features when calculating the area of development.

October 2017

Field Supplement to Evaluating the Condition of Streams and Riparian Management Areas • 1

FREP: Forest and Range Evaluation Program



Forest and Range Evaluation Program

Riparian Management Routine Effectiveness Evaluation

Sample No. _____ Date 10/17/2017 Evaluator(s) _____

Stream/Opening Identification

District: _____ Opening ID: _____ Licensee: _____
Forest licence: _____ Block: _____ Harvest year: _____
Stream name: _____ Harvest location: Both sides ☐ Left side ☐ Right side ☐
Stream class (plan) _____ (field) _____ Not a high value S0 ☐
Stream order: _____ Stand age by stream (yr): Left side _____ Right side _____
Number of road crossings: In reach: _____ Above reach in block: _____ Above block: _____
% of watershed developed upstream: _____ Main development(s): _____
Reach location: _____ to _____ m US ☐ DS ☐ from _____
UTM at US ☐ DS ☐ End of reach: Zone: _____ East: _____ North: _____
Channel width (m): _____ Channel depth (m): _____ Channel gradient (%): _____
Wetted width (m): _____ Wetted depth (m): _____ D95 (cm): _____ D50 (cm): _____
Largest mobile bed material: Boulders ☐ Cobbles ☐ Gravel ☐ Sand ☐ Fines ☐
Channel morphology: Riffle-cascade/pool ☐ Step/pool ☐ Non-alluvial ☐
Water pH _____ Temp _____ Total reach length (m) _____ Visible length (m) _____

Riparian Retention Information (Do not factor road crossings into width measurements)

	Left Side	Right Side
Length of sample reach with full retention (m):	_____	_____
Length of sample reach with partial retention (m):	_____	_____
Average width of full retention present (max. 100 m):	_____	_____
Average width of partial retention present (max. 100 m):	_____	_____
Average retention in partial retention area (% of basal area):	_____	_____
Average distance (m) from stream edge to trees or stumps:	_____	_____

Photographs

FREP map online tool

<https://governmentofbc.maps.arcgis.com/apps/MapSeries/index.html?appid=b738c13cda9e4b8d9bd6e05ff9f9d2a9>

The Forest and Range Evaluation Program - FREP Map Portal

FREP Map Portal

FREP Map



Welcome to
The FREP Map Portal



This portal provides information and mapped datasets to the Provincial Stewardship individuals involved with the Forest and Range Evaluation Program (FREP).

Search Box

Please use the search box function in the FREP Map to find the location of your study area, field site or site of interest.



FREP Map Portal

FREP Map



BRITISH
COLUMBIA

Forest & Range Evaluation Program Map



1365852



Show search results for 1365852

Layer List



Operational layers



▶ ☐ FREP Riparian Data



▶ ☐ Water Quality Rating



▶ ☒ Roads



▶ ☒ Forestry Roads



▶ ☒ Openings

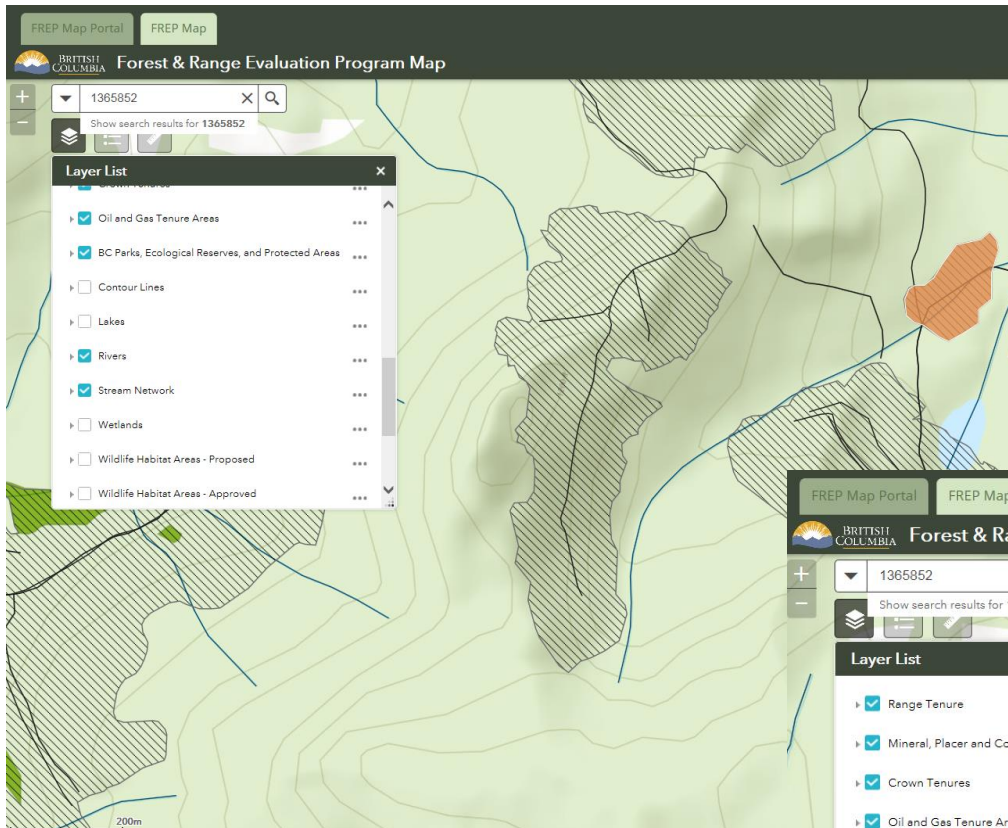
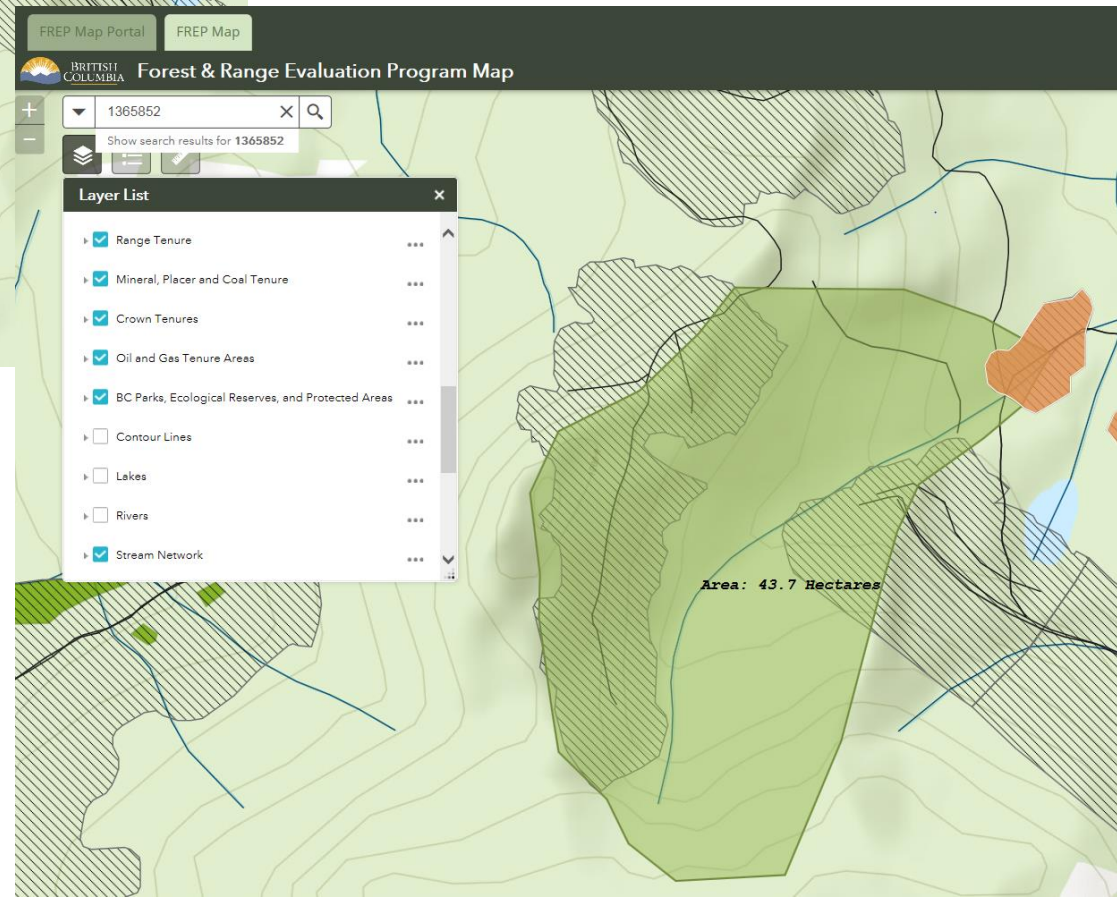


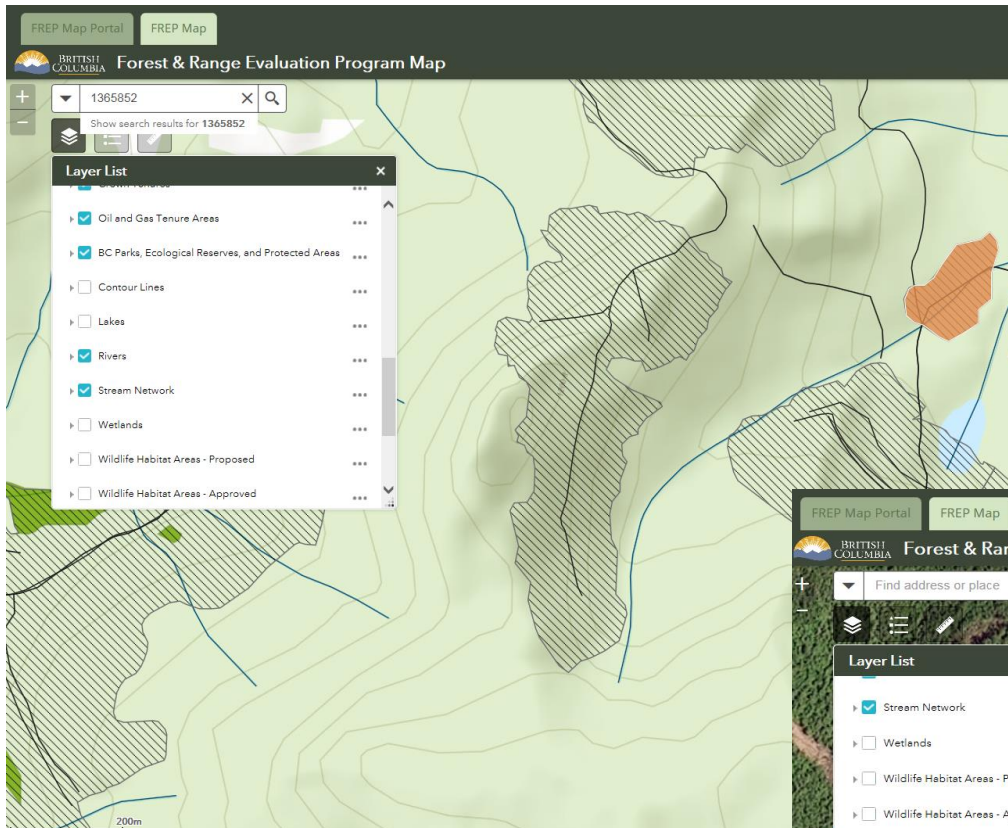
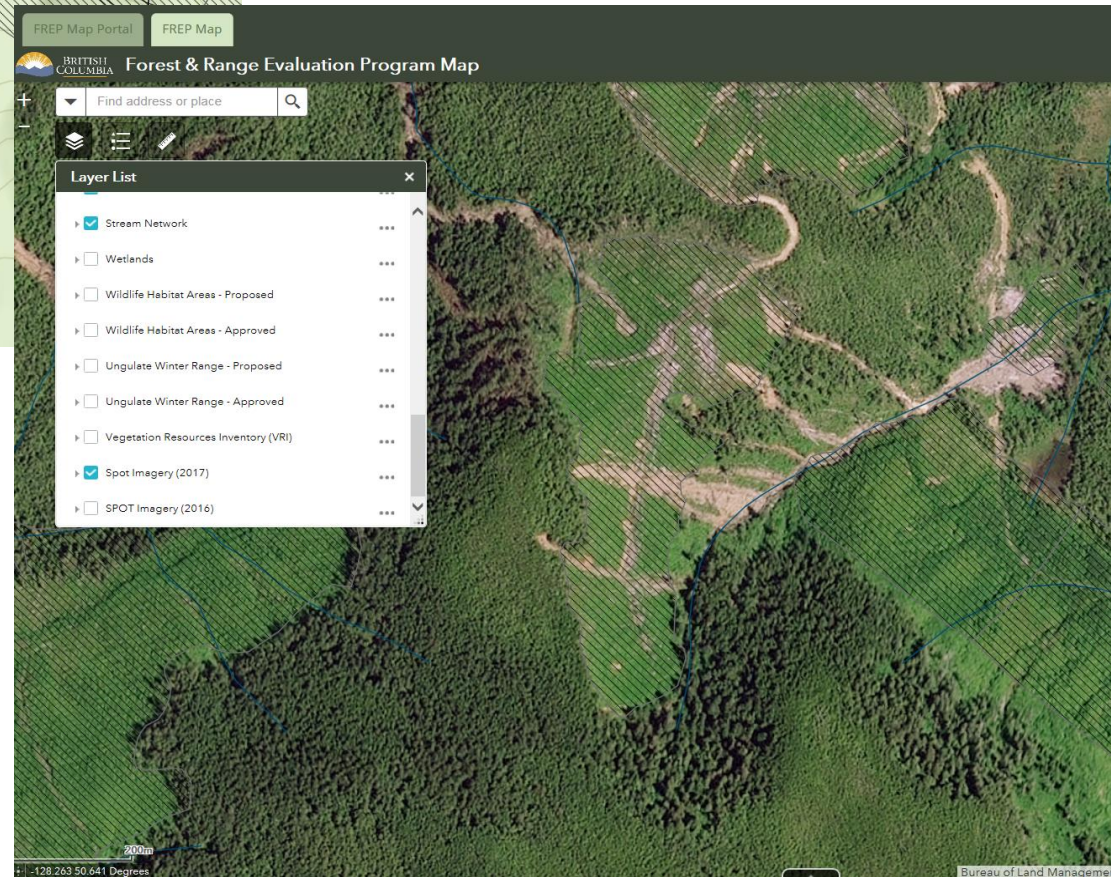
▶ ☒ Forest Cover Reserve



▶ ☐ Forest Cover Silviculture







Suggestions for FREP

- Recognize that the “important” S6 streams are being managed more carefully.
- Separate S6’s by “high value” and “not high value” when reporting out.

 **BRITISH COLUMBIA** Forest and Range Evaluation Program **Riparian Management Routine Effectiveness Evaluation**

Sample No. _____ Date /YY/MM/DD Evaluator(s) _____

Stream/Opening Identification

District: _____ Opening ID: _____ Licensee: _____
Forest licence: _____ Block: _____ Harvest year: _____
Stream name: _____ Harvest location: Both sides ☐ Left side ☐ Right side ☐
Stream class (plan) _____ (field) ☐ Not a high value S6 ☐
Stream order: _____ Stand age by stream (yrs): _____ Left side _____ Right side _____
Number of road crossings: In reach: _____ Above reach in block: _____ Above block: _____
% of watershed developed upstream: _____ Main development(s): _____
Reach location: _____ to _____ m US ☐ DS ☐ from _____
UTM at US ☐ DS ☐ End of reach: Zone: _____ East: _____ North: _____
Channel width (m): _____ Channel depth (m): _____ Channel gradient (%): _____
Wetted width (m): _____ Wetted depth (m): _____ D95 (cm): _____ D50 (cm): _____
Largest mobile bed material: Boulders ☐ Cobbles ☐ Gravel ☐ Sand ☐ Fines ☐
Channel morphology: Riffle-cascade/pool ☐ Step/pool ☐ Non-alluvial ☐
Water pH _____ Temp _____ Total reach length (m) _____ Visible length (m) _____

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Average width of full retention present (max. 100 m):	_____	_____
Average width of partial retention present (max. 100 m):	_____	_____
Average retention in partial retention area (% of basal area):	_____	_____
Average distance (m) from stream edge to trees or stumps:	_____	_____

Photographs

 **BRITISH COLUMBIA** Forest and Range Evaluation Program **Riparian Management Routine Effectiveness Evaluation V1.1.4**

+ New Sample 2018-02-23 12345

Basics Field Data Riparian Checklist Closing Cor

Field Stream Class class in field S6 ☐ Not a high-value S6 ☐

Channel characteristics

Width (m) m

Depth (m) m

Not a high-value S6

Check this box if **NONE** of the following apply within the sample reach:

- Direct tributary to a defaulted or known fish stream or the ocean ("direct" means same order OR within 200 m)
- > 1.0 m channel width with perennial (year round) flow
- Contains habitat for regionally important wildlife or species at risk
- Contains other rare ecological attributes or sensitive geomorphological characteristics (e.g. alluvial fan)
- Drains into a community watershed or water license intake

Geographic Coordinates (Decimal Degrees)

S6 categories

High value

- Directly connected to fish stream or ocean.
- Greater than 1.0 m in channel width AND perennial flow.
- Contains habitat for local species at risk.
- Drains into community watershed or water license intake.
- Contains other rare ecological attributes or sensitive geomorphological characteristics (eg. alluvial fan)

Not high value

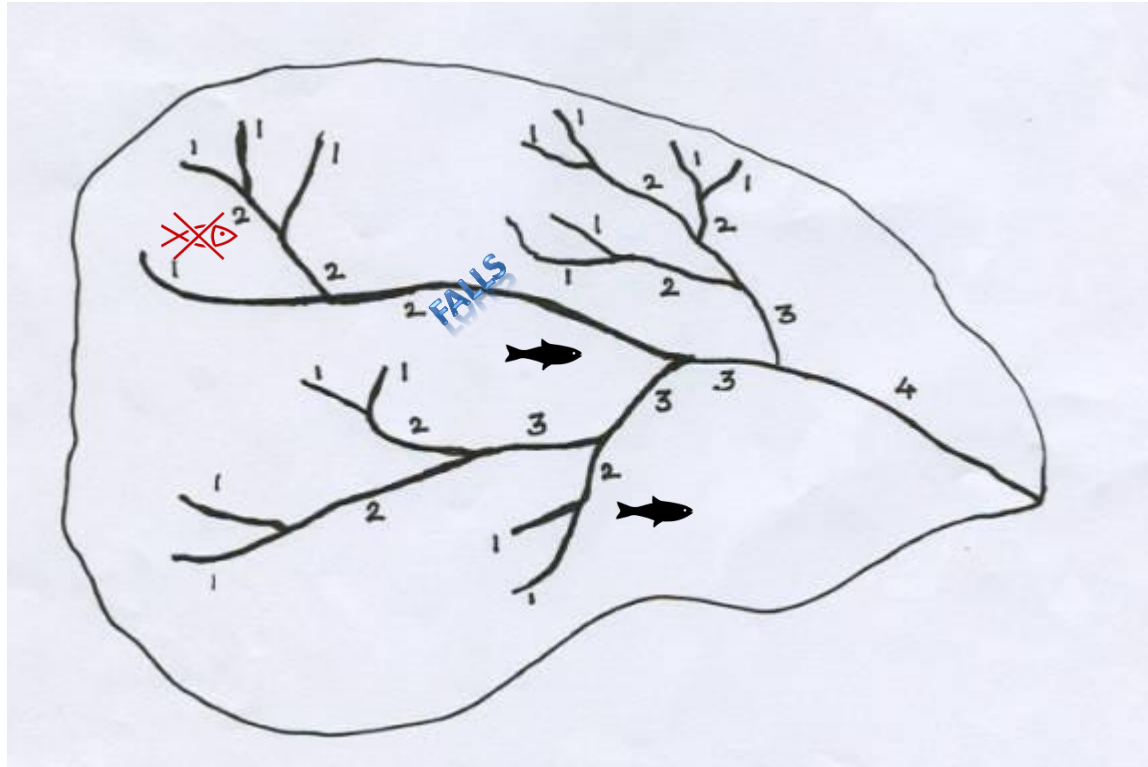
- None of the high value characteristics apply.

Example is a very small or seasonal drainage that is not directly connected to a fish stream.

“Not high value” ≠ “No management”
– Less shade + LWD supply ok, but still need to maintain channel so flow, inverts, and nutrients reach downstream reaches.

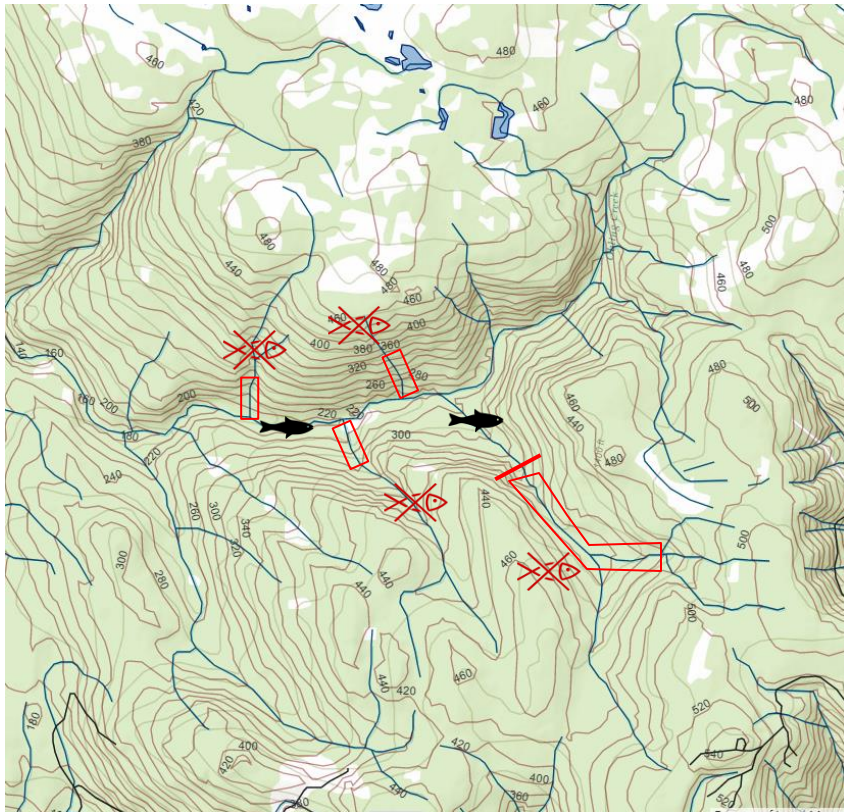
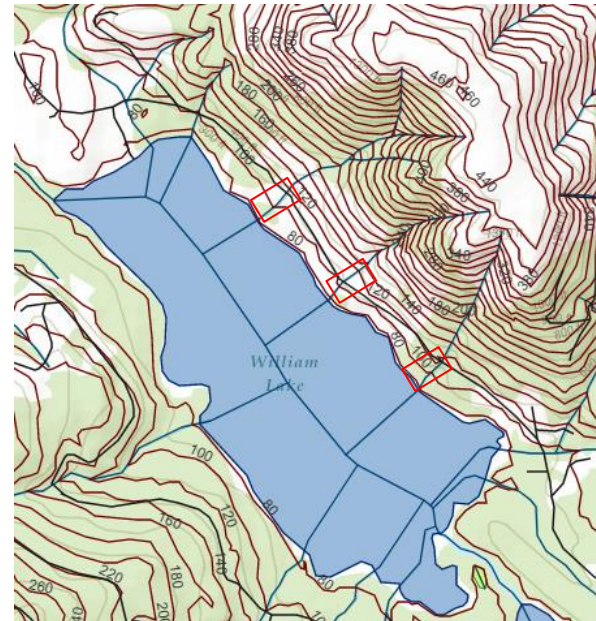
`Directly Connected`

FPPR: Direct tributary stream means same order.



For **high value** S6 definition, we add first 200m of lesser-order tributaries

- Zone of influence



New issue identified :

Stream classification

Practice: Classification of some small, steep drainages as S6, though they do not meet the definition of a stream (coast).

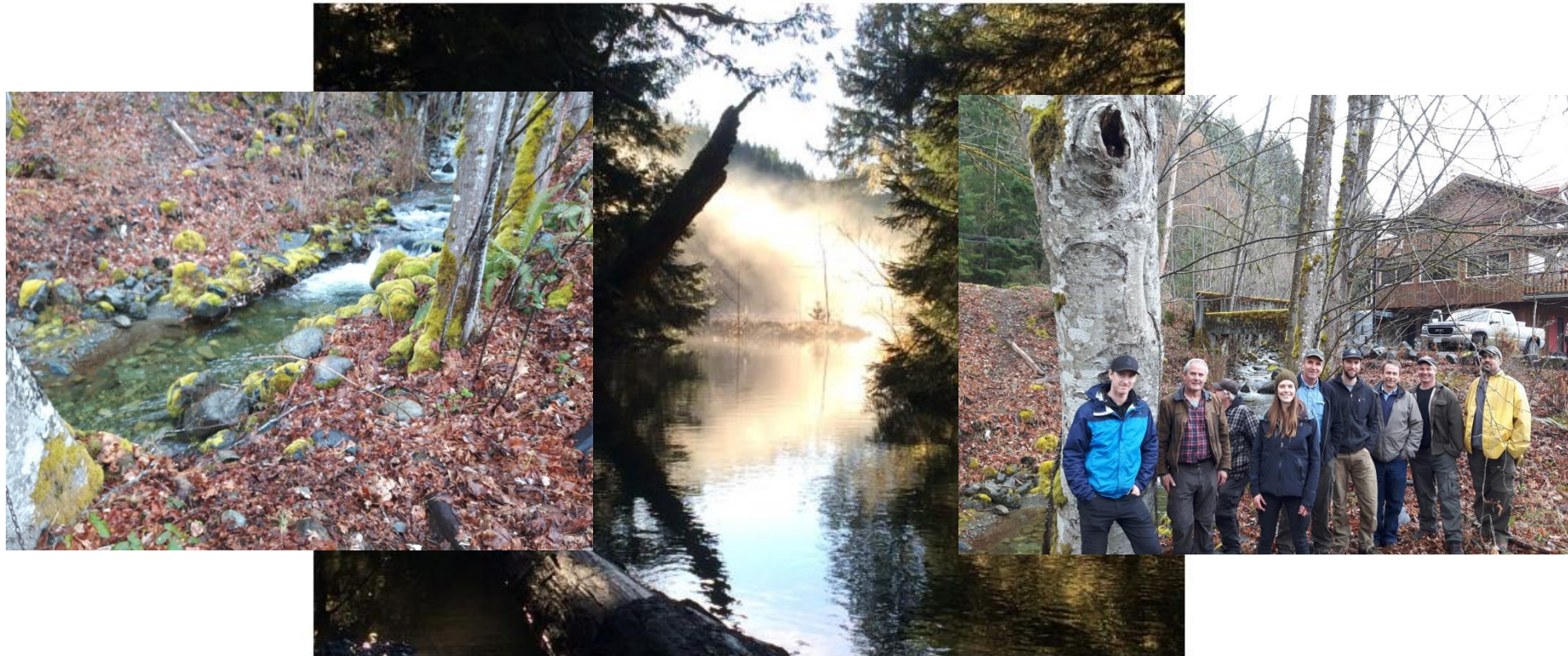
Practice: Classification of some low-gradient streams as non-fish solely based on the presence of a barrier downstream.

Result: Misclassification can lead to less-informed block placement, disturbance to S4 & high value S6 streams, and potential harvest of riparian reserves around S3 streams.

Solution: Streamclass guidance now under development.

Stream Classification Guidance

Classroom/Field training. Presentation materials and manuals are currently under review and revision.



**Fish-Stream Classification Guidelines
for British Columbia**

Suggestions for FREP

- Include harvest method when reporting out.
- More immediate communication where problems are identified.
- Desire for reporting that is more specific to what can be managed.
 - Causal factors specific to the “no” answers (impacts) are now reflected in a new checklist in riparian protocol

Sample No. _____

Specific Causes of “No” Answers and Proximity to Reach of Each Cause.
Check off each Question with a “No” answer, then beside each main specific cause that applies, record a 1 for within the reach, 2 for above the reach, and 3 for within and above the reach

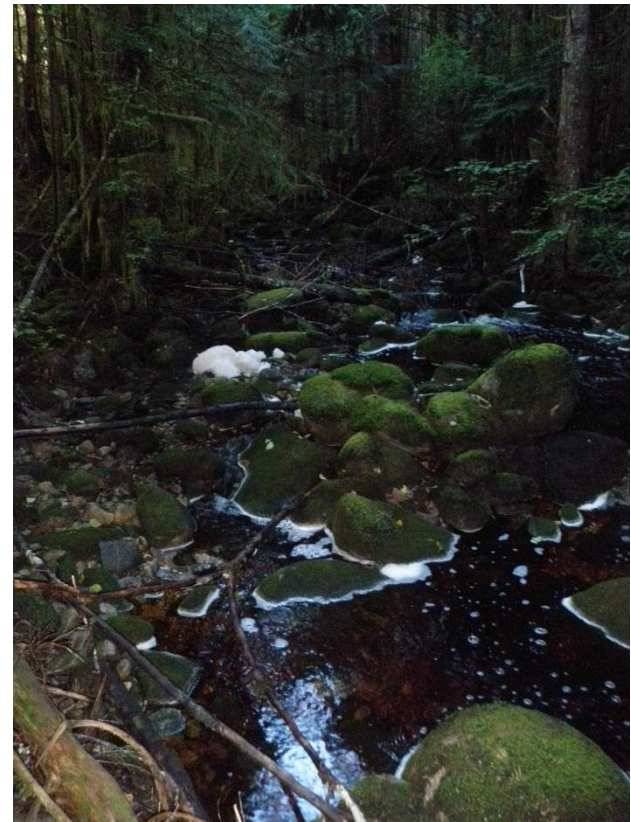
Cause of “No” Answers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
OLD LOGGING															
Low retention															
Falling and yarding															
Machine disturbance															
Windthrow															
Mass wasting															
Stream diversions															
Road/debris blockages															
Forest structure issues															
Other															
CURRENT LOGGING															
Low retention															
Falling and yarding															
Machine disturbance															
Windthrow															
Mass wasting															
Stream diversions															
Road/debris blockages															
Other															
ROADS, TRAILS															
Encroachment on RMA															
Running surface erosion															
Other ROW erosion															
Mass wasting															
Crossing structure															
Other															
ANIMAL DISTURBANCE															
Livestock															
Beavers															
Other ungulates															
Humans															
Other															
NATURAL IMPACTS															
High sediment levels															
Fire															
Insects															
Diseases															
Wind															
Mass wasting															
Floods															
Other															
OTHER IMPACTS															
Non-logging roads, trails															
Utility corridors															
Recreation															
Agriculture															
Mining															
Urban, industry															
Other															
UNKNOWN															

2017 Riparian Results

district_code	DNI			
Column Labels				
	Properly Functioning (0-2 No's)	Functioning but at Risk (3-4 No's)	Not Properly Functioning (>6 No's)	Grand Total
Count of condition	1	2	4	7

PFC (1) and FR (2)

- S2, S3, S4.
- All were adjacent to the block, with buffers on the harvested edge ranging from 22-52 m.
- No road crossings in or above reach.
- Upstream watershed less than 20% developed.
- Impacts from natural causes, old logging.



Not properly functioning (4)

- All S6 reaches.
- All within block with 0-1m retention.
- 3 out of 4 had numerous road crossings upstream.
- 20-100% of upstream basin was developed (forestry).
- 77% of impacts caused by recent logging. Impacts include bed and bank disturbance; blockages; lack of streamside vegetation for LWD supply, shade, and bank stability; excessive fine sediments; low moss coverage.
- Specific impacts mainly caused by falling and yarding.



Thanks for listening!
Questions?

