



Sample No. _____ Date / / 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 on plans: _____ Stream class in field: _____ Reach length (m): _____

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

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

Sample No. _____

Field Data									
Question Indicator	Point Indicators (Measure at 6 equidistant points or transects along the reach)	Transect No.						Total	Mean
		1	2	3	4	5	6		
NA	Width of buffer strip on left side								
NA	Width of buffer strip on right side								
Q7(a)	% Moss								
Q8 (a)	% Fines/sands in riffles								
Q9 (a)	No. sensitive invertebrate types								
Q9 (b)	No. major invertebrate groups								
Q9 (c)	No. insect types								
Q9 (d)	Total No. invertebrate types								
Q13 (b)	% Shade								
Q14 (a)	% Disturbance – increaser species								
Q14 (b)	% Noxious weeds/invasives								

Record the number of different types of invertebrates observed in each sub-group, at each transect sampled. The numbers recorded under each "transect number" are the numbers you use to complete the point indicators table above.

Major Group	Sub Group	Sensitivity	Transect Number					
			1	2	3	4	5	6
Insects	Mayflies 	Yes						
	Stoneflies 	Yes						
	Caddisflies 	Yes						
	Chironomids ('midges') 	No						
	Other Diptera 	No						
	Riffle beetle larvae 	Yes						
	Other beetle larvae, adults 	No						
Bivalves	Clams, mussels 	Yes						
Snails	Right side snails 	Yes						
	Left side snails 	No						
Flatworms	Flatworms ("Planaria") 	No						
Nematodes	Nematodes 	No						
Worms	Segmented worms 	No						
Crustaceans	Crustaceans 	No						
Arachnids	Spiders, mites 	No						
Others	Consult field guide in Appendix 2 of Protocol for identification of "other" invertebrates and their sensitivity.							

Sample No. _____

Field Data				
Question No. (Indicator)	Stream Types	Continuous Indicators (These are measured all along the reach to determine total length, numbers or areas present, as appropriate. Record the totals in the "Total" column, even if the total is an estimate. Calculate the percentage of the reach length, riparian area or number of trees represented by each total.)	Total	%
Q1(a)	RC	Mid-channel bars, wedges (m), measure all but no overlap		
Q1(c)	RC	Lateral bars (m), measure all but no overlap		
Q1(b,c)	RCS	Multiple or braided channels (m), measure all but no overlap		
Q1(a)	Non-alluvial	Moss along the channel bed (m), measure all but no overlap		
Q2	All	Naturally erodible banks (m), measure all but no overlap		
Q2(a,a,b)	All	Recently disturbed bank (m), measure all but no overlap		
Q2(c,c)	RCS	Stable undercut bank (m), measure all but no overlap		
Q2(b,b,a)	All	Shallow rooted banks (m), measure all but no overlap		
Q2(d,d,c)	All	Recently upturned bank root wads, (m) measure all but no overlap		
Q4(a)	RC	Pool length (m)		
Q10	All	No. New windthrow (live trees only)		
Q10	All	No. Old windthrow (but alive when windthrown)		
Q10	All	No. Standing trees		NA
Q11(a)	All	Bare erodible ground in first 10m (m ²), do not include active roads		
Q13(a)	All	Bare erodible ground exposed to rain in first 10m (m ² , do not include active roads)		
Q11(b)	All	Bare erodible ground in first 10m, plus all bare soil hydrologically connected to first 10m (m ²)		
Q11(c)	All	Compacted (disturbed) ground in first 10m (m ² , do not include active roads)		
Q11(d)	All	Compacted (disturbed) ground in first 10m, plus all compacted (disturbed) ground hydrologically connected to first 10m (m ²)		

% New Windthrow = (# New Windthrow) / (# New Windthrow + # Standing Trees) X 100

% Old Windthrow = (# Old Windthrow) / (# Old Windthrow + # New Windthrow + # Standing Trees) X 100

Other Indicators to Note (Answer Yes, No, or NA as appropriate for the questions)				
Q01-04	Boulder Line/Step Pool Characteristics – For Step-Pool Streams Only (Use Table 1 to help answer the questions)	Yes	No	NA
Q1(a)	Do 50% or more of the boulder lines/steps span the channel?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q1(b)	Do 25% or more of the boulder lines/steps have moss?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q4(a)	Do 25% or more of the boulder lines/steps have plunge pools as deep as the largest rock in the line?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q4(b)	Do cascades lacking boulder lines/steps represent less than 25% of the reach?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q01	Sediment and LWD Storage Characteristics – For Non-Alluvial Streams Only			
Q1(b)	Do sediment and/or LWD deposits that completely fill the channel up to the top of the banks represent less than 5% of the reach length?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q1(c)	Are moveable sediments widely distributed in small pockets along the whole stream reach, not concentrated in a few relatively large compartments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q03	Wood Characteristics (Use Table 2 to help answer the questions. Q3(b) is NA for non-alluvial streams)			
Q3(a)	Is the wood in the channel mainly “old”?	<input type="checkbox"/>	<input type="checkbox"/>	
Q3(b)	Do 1-12 accumulations of wood span the channel?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q3(c,c,b)	Do half or more of the wood accumulations present lack “new” wood?	<input type="checkbox"/>	<input type="checkbox"/>	
Q3(d,d,c)	Is the wood in the channel mainly across or diagonal to the main axis of the stream, not parallel?	<input type="checkbox"/>	<input type="checkbox"/>	
Q3(e,e,d)	Is the wood in the channel intact; i.e. not recently lost or moved by hand, catastrophic floods, debris flows, debris torrents?	<input type="checkbox"/>	<input type="checkbox"/>	
Q04	Surface Sediment Texture – For Riffle and Cascade Pool Streams Only			
Q4(b)	Is the texture of the surface substrate mainly heterogenous?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q04	Deep Pools – For Riffle, Cascade, and Step Pool Streams Only			
Q4(b)	Are two or more deep pools present? (Tip: A deep pool is a pool whose depth from the deepest spot of the pool to the top of the bank is twice the same depth at riffle crests)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q05	Connectivity			
Q5(a)	Are temporary blockages to fish, sediment or debris absent?	<input type="checkbox"/>	<input type="checkbox"/>	
Q5(b)	Is down-cutting that blocks fish movements or isolates the channel from the adjacent floodplain absent?	<input type="checkbox"/>	<input type="checkbox"/>	
Q5(c)	Are sediment or debris buildups absent at or in all crossing structures?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q5(d)	Is down-cutting below any crossing structure that blocks fish movements upstream by any size fish at any time absent?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q5(e)	Are all crossing structures on fish bearing streams open-bottomed structures?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Other Indicators to Note (Answer Yes, No, or NA as appropriate for the Questions)				
Q05 Connectivity (continued)		Yes	No	NA
Q5(f)	Is dewatering absent?	<input type="checkbox"/>	<input type="checkbox"/>	
Q5(g)	Are trails, roads or levees that isolate off-channel areas or divert normal overland flow away from the reach absent?	<input type="checkbox"/>	<input type="checkbox"/>	
Q5(h)	Is all water in the stream still flowing in its original channel, not withdrawn or diverted elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	
Q06 Fish Cover Diversity – For Fish-Bearing Streams Only (To be considered present, each type of cover should cover 1% or more of the total channel area)				
Q6(a)	Are deep pools present?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q6(b)	Are unembedded boulders present?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q6(c)	Is woody debris or other organic debris present?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q6(d)	Are undercut banks present?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q6(e)	Is aquatic vegetation present?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q6(f)	Is overhanging vegetation present?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q6(g)	Are there stable gravels and cobbles present with spaces for fish to hide in?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q08 Fine Inorganic Sediments				
Q8(a)	Are riffles or pool/riffle breaks free of fine or sand/sized inorganic sediments that “blanket” the streambed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q8(b)	Is the channel free of “quick sand” or “quick gravel”?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q8(c)	Is the substrate mostly unembedded?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q13 Bank Microclimate				
Q13(c)	Are moisture-loving plants present and in good condition?	<input type="checkbox"/>	<input type="checkbox"/>	
Q13(d)	Are the bank soils all moist and cool?	<input type="checkbox"/>	<input type="checkbox"/>	
Q15 Riparian Structure (Use Table 3 to help answer this question)				
Q15(a)	Does the distribution and relative abundance of the vegetation layers and forest components present collectively approach 75% of what the healthy unmanaged riparian plant community would normally be along the reach?	<input type="checkbox"/>	<input type="checkbox"/>	
Q15 Riparian Form, Vigor, and Recruitment (Use Table 4 to help answer this question)				
Q15(b)	Does the form, vigor and recruitment of the vegetation layers or forest components present collectively approach 75% of what the healthy unmanaged riparian plant community would normally be along the reach?	<input type="checkbox"/>	<input type="checkbox"/>	
Q15 Browsing, Grazing				
Q15(c)	Is heavy browse absent? (TIP: Mark “No” if even one plant shows heavy browse)	<input type="checkbox"/>	<input type="checkbox"/>	
Q15(d)	Is most (90%) of the available forage free of heavy grazing?	<input type="checkbox"/>	<input type="checkbox"/>	

Field Data Summary Tables				
Table 1. Boulder-line/step characteristics of step-pool type reaches (Q1B, Q4B)				
Number of boulder lines/steps	Number of channel spanning boulder lines/steps	Number of boulder lines/steps with moss	Number of boulder lines/steps with a deep plunge pool	Length of reach with no boulder steps and plunge pools

Table 2. Wood characteristics of sample reach (Q3)				
Number of wood Accumulations	Number of wood accumulations with new, recently deposited wood	Number of channel spanning wood accumulations (NA for non-alluvial streams)	Main age of wood in each accumulation (Record "O" for old, "N" for new)	Main orientation of wood in each accumulation (Record "P" for parallel, "X" for across or diagonal)

Table 3. Riparian Structure (Q15a) Using the table below, estimate whether the distribution or relative abundance of the forest components present collectively approach 75% of what the healthy unmanaged riparian plant community would normally be along the reach.											
Snags (%)	Gaps (%)	Over-story trees (%)	Under-story trees (%)	Tall shrubs (%)	Low shrubs (%)	Herbs (%)	Mosses (%)	Lichens (%)	CWD (%)	Total (Sum of %'s)	Average % (Answer to Q15a)

Table 4. Riparian Vegetation Form, Vigor, and Recruitment (Q15b) Using Yes or No answers for each table cell below, determine if 75% or more of the cells have Yes answers, indicating that, collectively, form, vigor and recruitment is satisfactory.													
	Snags	Gaps	Over-story trees	Under-story trees	Tall shrubs	Low shrubs	Herbs	Mosses	Lichens	CWD	Total possible number of Yes answers	Actual number of Yes answers	% of cells with Yes answers (Answer to Q15b)
Form													
Vigor	NA	NA								NA			
Recruitment													

Riparian Effectiveness Routine Evaluation Checklist		Yes	No
Question 1. Is the channel bed undisturbed?		<input type="checkbox"/>	<input type="checkbox"/>
<i>Note: For Question 1, decide what the predominant channel morphology is and then complete the section for that morphology only (i.e. Part A, B or C)</i>			
A) Riffle-pool or cascade-pool channels			
a)	Does less than 50% of the reach have active sediment wedges or mid-channel bars?	<input type="checkbox"/>	<input type="checkbox"/>
b)	Does less than 50% of the reach have active multiple channels and/or braids?	<input type="checkbox"/>	<input type="checkbox"/>
c)	Does more than 50% of the reach have lateral bars?	<input type="checkbox"/>	<input type="checkbox"/>
<i>If there are 2 or more "Yes" answers, mark the "Yes" box for Question 1. Otherwise mark the "No" box.</i>			
B) Step-pool channels			
a)	Do more than 50% of the steps present span the channel?	<input type="checkbox"/>	<input type="checkbox"/>
b)	Do more than 25% of the steps have moss?	<input type="checkbox"/>	<input type="checkbox"/>
c)	Does less than 25% of the reach have active multiple channels and/or braids?	<input type="checkbox"/>	<input type="checkbox"/>
<i>If there are 2 or more "Yes" answers, mark the "Yes" box for Question 1. Otherwise mark the "No" box.</i>			
C) Non-alluvial channels			
a)	Does 25% or more of the channel bed length have moss on the substrate?	<input type="checkbox"/>	<input type="checkbox"/>
b)	Do moveable sediments and/or debris deposits that completely fill the channel up to the top of the banks represent less than 5% of the total reach length?	<input type="checkbox"/>	<input type="checkbox"/>
c)	Are moveable sediments widely distributed in small pockets along the whole stream reach, not concentrated in a few relatively large compartments?	<input type="checkbox"/>	<input type="checkbox"/>
<i>If there are 2 or more "Yes" answers, mark the "Yes" box for Question 1. Otherwise mark the "No" box.</i>			

Please refer to "What is Stream Channel Morphology" in the riparian protocol for descriptions, tables and figures on channel morphology. If you are using the summary table that describes the general features of each type of channel morphology, base your decision on all the characteristics listed. The degree of channel incisement and the presence or absence of floodplains formed by sediments deposited by the stream and later vegetated are key criteria. If a stream is not meandering or depositing sediments that will eventually re-vegetate (i.e. "alluvial"), but just cutting through peat lands, colluvial deposits or glacial fluvial deposits and not adding material to the adjacent areas, call these streams non-alluvial.

Question 2. Are the channel banks intact?		Yes	No
		<input type="checkbox"/>	<input type="checkbox"/>
<i>Note: For Question 2, decide what the predominant channel morphology is and then complete the section for that morphology only (i.e. Part A, B or C)</i>			
A) Riffle-pool or cascade-pool channels			
a)	Does less than 15% of the total reach length have recently disturbed banks (e.g. banks disturbed by stream flows, sloughs, slumps, windthrow, infilling, animals, roads, or harvest and silviculture activities)?	<input type="checkbox"/>	<input type="checkbox"/>
b)	Are more than 65% of the banks on naturally erodible sections of the reach deeply rooted?	<input type="checkbox"/>	<input type="checkbox"/>
c)	Does more than 50% of the naturally erodible reach length have stable undercut banks?	<input type="checkbox"/>	<input type="checkbox"/>
d)	Does less than 10% of the total reach length have recently upturned (wind thrown) root wads along the banks?	<input type="checkbox"/>	<input type="checkbox"/>
<i>If there are 3 or more "Yes" answers, mark the "Yes" box for Question 2. Otherwise mark the "No" box</i>			
B) Step-pool channels			
a)	Does less than 10% of the total reach length have recently disturbed banks (e.g. banks disturbed by stream flows, slumps, sloughs, windthrow, infilling, animals, roads, or harvest and silviculture activities)?	<input type="checkbox"/>	<input type="checkbox"/>
b)	Are more than 75% of the banks on naturally erodible sections of the reach deeply rooted?	<input type="checkbox"/>	<input type="checkbox"/>
c)	Does more than 50% of the naturally erodible reach length have stable undercut banks?	<input type="checkbox"/>	<input type="checkbox"/>
d)	Does less than 25% of the total reach length have recently upturned (wind thrown) root wads along the banks?	<input type="checkbox"/>	<input type="checkbox"/>
<i>If there are 3 or more "Yes" answers, mark the "Yes" box for Question 2. Otherwise mark the "No" box</i>			
C) Non-alluvial channels			
a)	Does less than 10% of the total reach length have recently disturbed banks (e.g. banks disturbed by stream flows, sloughs, slumps, windthrow, infilling, animals, roads, or harvest and silviculture activities)?	<input type="checkbox"/>	<input type="checkbox"/>
b)	Are more than 75% of the banks on naturally erodible sections of the reach deeply rooted?	<input type="checkbox"/>	<input type="checkbox"/>
c)	Does less than 25% of the total reach length have recently upturned (wind thrown) root wads along the banks?	<input type="checkbox"/>	<input type="checkbox"/>
<i>If there are 2 or more "Yes" answers, mark the "Yes" box for Question 2. Otherwise mark the "No" box</i>			

Please refer to the Riparian Protocol for more descriptions of stable, vegetated undercut banks versus unstable, overhanging banks.

Question 3. Are channel LWD processes undisturbed?		Yes	No
		<input type="checkbox"/>	<input type="checkbox"/>
<i>Note: For Question 3, decide what the predominant channel morphology is and then complete the section for that morphology only (i.e. Part A, B or C)</i>			
A) Riffle-pool or cascade-pool channel			
a)	Is wood in the channel mainly old and/or stable?	<input type="checkbox"/>	<input type="checkbox"/>
b)	Do one to twelve accumulations of wood span the channel?	<input type="checkbox"/>	<input type="checkbox"/>
c)	Do half or more of all wood accumulations present lack new or recently deposited wood that is unstable?	<input type="checkbox"/>	<input type="checkbox"/>
d)	Is wood in the channel mainly across or diagonal to the main axis of the channel, not parallel?	<input type="checkbox"/>	<input type="checkbox"/>
e)	Is the wood in the channel mostly intact, (i.e. not recently lost or moved by hand, floods, debris torrents, debris flows)?	<input type="checkbox"/>	<input type="checkbox"/>
<i>If there are 4 or more "Yes" answers, mark the "Yes" box for Question 3. Otherwise mark the "No" box.</i>			
B) Step-pool channel			
a)	Is wood in the channel mainly old and/or stable?	<input type="checkbox"/>	<input type="checkbox"/>
b)	Are one to twelve accumulations of wood present in the channel?	<input type="checkbox"/>	<input type="checkbox"/>
c)	Do half or more of all wood accumulations present lack new or recently deposited wood that is unstable?	<input type="checkbox"/>	<input type="checkbox"/>
d)	Is wood in the channel mainly across or diagonal to the main axis of the channel, not parallel?	<input type="checkbox"/>	<input type="checkbox"/>
e)	Is the wood in the channel mostly intact, (i.e. not recently lost or moved by hand, floods, debris torrents, debris flows)?	<input type="checkbox"/>	<input type="checkbox"/>
<i>If there are 4 or more "Yes" answers, mark the "Yes" box for Question 3. Otherwise mark the "No" box.</i>			
C) Non-alluvial channel			
a)	Is wood in the channel mainly old and/or stable?	<input type="checkbox"/>	<input type="checkbox"/>
b)	Do half or more of all wood accumulations present lack new or recently deposited wood that is unstable?	<input type="checkbox"/>	<input type="checkbox"/>
c)	Is wood in the channel mainly across or diagonal to the main axis of the channel?	<input type="checkbox"/>	<input type="checkbox"/>
d)	Is the wood in the channel mostly intact, (i.e. not recently lost or moved by hand, floods, debris torrents, debris flows)?	<input type="checkbox"/>	<input type="checkbox"/>
<i>If there are 3 or more "Yes" answers, mark the "Yes" box for Question 3. Otherwise mark the "No" box.</i>			

TIP: "Old" wood is wood that is stable, and well incorporated into the streambed, streambanks or pre-existing log jams. The wood is usually mossy. "New" wood is any wood that is not yet stable or well incorporated into the streambed, streambanks or stable log jams. New wood is usually wood that was recently deposited after road building and the latest harvesting was started. This could include stems or branches that were blown off trees after harvesting started, or old wood that has recently moved and is no longer stable. TIP: If half or more of the reach length is completely filled with wood, consider this to be more than 12 accumulations of wood.

Question 4. Is the channel morphology intact? (Mark NA if the channel is non-alluvial, and therefore lacking a riffle-pool, cascade-pool or step-pool morphology)		Yes	No	NA
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Note: For Question 4, decide what the predominant channel morphology is and then complete the section for that morphology only (i.e. Part A or B)</i>				
A) Riffle-pool or cascade-pool channel				
a)	Are pools present along >25% of the reach?	<input type="checkbox"/>	<input type="checkbox"/>	
b)	Is the surface sediment texture mainly heterogenous and well sorted, i.e. is the range of sediment classes (sands, gravel, cobbles, etc.) present on the streambed large and well sorted by water?	<input type="checkbox"/>	<input type="checkbox"/>	
c)	Are two or more deep pools present? (A deep pool is a pool with a channel depth twice the average channel depth at riffle crests).	<input type="checkbox"/>	<input type="checkbox"/>	
<i>If there are 2 or more "Yes" answers, mark the "Yes" box for Question 4. Otherwise mark the "No" box.</i>				
B) Step-pool channel				
a)	Are plunge pools frequent, i.e. are >25% of the steps associated with a plunge pool with depths similar to the size of the largest rock in the step?	<input type="checkbox"/>	<input type="checkbox"/>	
b)	Does the channel alternate almost exclusively between steps and pools (i.e. less than 25% of the channel consists of relatively long cascades)?	<input type="checkbox"/>	<input type="checkbox"/>	
c)	Are two or more deep pools present? (A deep pool is a pool with a channel depth twice the average channel depth at the steps, i.e. the "riffle crests").	<input type="checkbox"/>	<input type="checkbox"/>	
<i>If there are 2 or more "Yes" answers, mark the "Yes" box for Question 4. Otherwise mark the "No" box.</i>				

TIP: A stream reach can have aspects of both cascade-pool and step-pool morphology. Use the predominant morphology to decide which set (A or B) of indicator statements to use.

TIP: Steep streams (with gradients between approximately 5-15%) that look like long cascades could be step-pool streams that are filled in with abundant sediment. Even steeper streams (with gradients much greater than 15%) are probably non-alluvial, especially small streams.

TIP: Only measure the lengths of the main pools present. These are the pools that extend from one side of the wetted channel to the other. Do not include the small pools that are often present behind boulders in riffles or cascades or the small backwater or back eddy pools that might be present along the margins of riffles and cascades.

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Question 5. Are all aspects of the aquatic habitat sufficiently connected to allow for normal, unimpeded movements of fish, organic debris, and sediments?		Yes	No	NA
		<input type="checkbox"/>	<input type="checkbox"/>	
a)	Are temporary blockages to fish movements upstream or debris or sediment movements downstream absent (e.g. weirs, dams, culverts, beaver dams, impermeable log jams)?	<input type="checkbox"/>	<input type="checkbox"/>	
b)	Is down cutting in the main channel that now isolates the floodplain from normal flooding or blocks access to tributary streams or off-channel areas absent?	<input type="checkbox"/>	<input type="checkbox"/>	
c)	Are build-ups of sediment or debris above or within any crossing structure absent, i.e. is the ability of the crossing to transport water and sediments downstream unimpaired?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d)	Are all crossing structures free of any down cutting that blocks fish movements upstream by any size fish at any time?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e)	On fish bearing streams, are all crossing structures open bottom structures?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f)	Is dewatering over the entire channel width due to excessive new accumulations of sediment absent?	<input type="checkbox"/>	<input type="checkbox"/>	
g)	Are all off-channel or overland flow areas still connected to the main channel, not isolated or cut off by roads or levees?	<input type="checkbox"/>	<input type="checkbox"/>	
h)	Is all water in the stream still in the stream, not withdrawn or diverted elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	
<p><i>If there are any "No" answers, mark the "No" box for Question 5. Otherwise mark the "Yes" box.</i></p>				

TIP: For Question 5, part (a), consider a temporary blockage a "blockage" if more than 2/3 of the flow seeps through or spills over the blockage when the water level is close to the rooted edge. Note that active beaver dams will almost always be temporary blockages. TIP: "Down cutting" refers to channel incisement; i.e. the vertical movement of the channel downwards into the channel bed.

Question 6. Does the stream support a good diversity of fish cover attributes? To qualify as cover, each cover attribute should represent at least 1% of the total stream area observed. (Mark NA if the stream is non-fish bearing; i.e. classes S5 or S6)		Yes	No	NA
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a)	Is deep pool habitat available?	<input type="checkbox"/>	<input type="checkbox"/>	
b)	Are stable, unembedded boulders present?	<input type="checkbox"/>	<input type="checkbox"/>	
c)	Are stable rootwads, woody debris or other organic material that fish can hide in present? "Other" organic debris is made up mostly of uncompacted leaf and/or wood particles that small fish can hide under.	<input type="checkbox"/>	<input type="checkbox"/>	
d)	Are stable, deep-rooted undercut banks present?	<input type="checkbox"/>	<input type="checkbox"/>	
e)	Is submerged or emergent aquatic vegetation present?	<input type="checkbox"/>	<input type="checkbox"/>	
f)	Is overhanging vegetation present within 1 m of the top of the channel?	<input type="checkbox"/>	<input type="checkbox"/>	
g)	Are stable unembedded gravels and cobbles with void spaces for fish to hide in present?	<input type="checkbox"/>	<input type="checkbox"/>	
<p><i>If there are five or more "Yes" answers, mark the "Yes" box for Question 6. Otherwise, mark the "No" box.</i></p>				

TIP: Question 6 is "NA" if the stream is non-fish bearing. Also, if there are no deep pools, there is no deep pool habitat.

Question 7. Does the amount of moss present in shallow areas of the channel indicate a stable and productive system? (Mark "NA" if the sample is all pool habitat or the streambed naturally lacks a stable mineral substrate for moss to grow on)		Yes	No	NA
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a)	Are moss patches on stable mineral substrates easily observed from almost any point along the margins, riffles or shallow pools of the stream? Where visibility is poor, is average coverage on mineral substrates 1% or more of the channel bed?	<input type="checkbox"/>	<input type="checkbox"/>	
b)	Are half or more of the moss patches present (even uncommon, occasional or rare patches) generally intact, not embedded with sediments, buried or damaged by scouring? Mark "NA" if no moss is present.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c)	Are moss patches generally vigorous, not stressed, dried or dead? Mark "NA" if no moss is present.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>If there are any "No" answers, mark the "No" box for Question 7. Otherwise, mark the "Yes" box.</i>				

Question 8. Has the introduction of sand or fine sized inorganic sediments been minimized? (Mark "NA" when the largest mobile sediment present in the reach is sand from natural sources only)		Yes	No	NA
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a)	Are inorganic ("gritty" feeling) fine and sand-sized sediments in riffles or critical spawning areas best described as little or lacking? Little or lacking is when average coverage in riffles or critical spawning areas is less than 10%, and no one area of this habitat equal to 1% or more of the total channel area is completely covered ("blanketed") with fines or sands.	<input type="checkbox"/>	<input type="checkbox"/>	
b)	Are individual wetted areas of gravel or sand that a foot can be easily pushed or wiggled into all smaller than an area equal to 1% of the total channel area?	<input type="checkbox"/>	<input type="checkbox"/>	
c)	Are gravels and cobbles unembedded in a matrix of sand or finer sized particles? Unembedded means that most of the gravel and cobbles are touching each other and easy to move.	<input type="checkbox"/>	<input type="checkbox"/>	
d)	Is there an average of one or more sensitive invertebrate types at invertebrate sample sites? Mark "NA" if high water conditions prevent effective sampling or the sample sites are dry due to natural conditions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>If there are any "No" answers, mark the "No" box for Question 8. Otherwise, mark the "Yes" box.</i>				

TIP: If the stream banks from top to bottom on both sides are all naturally composed of sand or finer size sediments, then it is probable the fines on the streambed are also natural.

Question 9. Does the stream support a diversity of aquatic invertebrates? (Mark "NA" if high water conditions prevent effective sampling or sample sites are dry due to natural conditions)		Yes	No	NA
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a)	Is an average of one or more sensitive invertebrate (e.g. a caddisfly, stonefly, mayfly or freshwater clam) present at the sites sampled?	<input type="checkbox"/>	<input type="checkbox"/>	
b)	Is an average of two or more different major invertebrate groups (e.g. insects, worms, crustaceans, etc.) present at the sites sampled?	<input type="checkbox"/>	<input type="checkbox"/>	
c)	Is an average of three or more recognizably different insects present at the sites sampled?	<input type="checkbox"/>	<input type="checkbox"/>	
d)	Is an average of four or more recognizably different invertebrates present at the sites sampled?	<input type="checkbox"/>	<input type="checkbox"/>	
<i>If there are two or more "Yes" answers, mark the "Yes" box for Question 9. Otherwise, mark the "No" box.</i>				

Sample No. _____

Question 10. Has the vegetation retained in the RMA been sufficiently protected from windthrow? (Note: only dominant or co-dominant trees that were alive when they were windthrown count as windthrow).		Yes	No	NA
		<input type="checkbox"/>	<input type="checkbox"/>	
a)	The incidence of post-treatment windthrow (living trees) in S1-S3 RRZs or S4-S6 RMZs with WTPs does not exceed 5% of the living stems, over and above what occurs naturally in the area. Mark NA and answer 10 b) if there is no reserve zone, or management zone with wildlife trees or wildlife tree patches.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b)	The incidence of post-treatment windthrow (living trees) in S4-S6 RMZs that are not part of a WTP does not exceed 10% of the living stems, over and above what occurs naturally in the area. Mark NA if there is a reserve zone or wildlife tree patch adjacent to the stream, and answer 10 a).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c)	Designated wildlife trees in S1-S6 RMAs are still standing, or if windthrown (living trees), still functional as wildlife trees (e.g. above-ground bear dens). Mark NA if there are no designated wildlife trees.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If there are any "No" answers, mark the "No" box for Question 10. Otherwise, mark the "Yes".

$$1. \quad \% \text{ Old Windthrow} = \frac{(\# \text{ Old Windthrow Trees})}{(\# \text{ Standing Trees} + \# \text{ Old Windthrow} + \# \text{ New Windthrow})} \times 100$$

$$2. \quad \% \text{ New Windthrow} = \frac{(\# \text{ New Windthrow Trees})}{(\# \text{ Standing Trees} + \# \text{ New Windthrow})} \times 100$$

To calculate % new windthrow over and above the natural pre-treatment windthrow, subtract (1) from (2).

Question 11. Has the amount of bare erodible ground or soil compaction in the riparian area been minimized?		Yes	No
		<input type="checkbox"/>	<input type="checkbox"/>
a)	Is total bare erodible ground area present in the first 10 m of the riparian area (<u>not</u> counting active road right-of-ways) less than 1% of the total riparian area?	<input type="checkbox"/>	<input type="checkbox"/>
b)	Is total bare erodible ground area present in the first 10 m of the riparian area, plus all other bare erodible ground hydrologically linked to the first 10 m of riparian area less than 5% of the total riparian area?	<input type="checkbox"/>	<input type="checkbox"/>
c)	Is the total area compacted (disturbed) by animals or machinery in the first 10 m of the riparian area (<u>not</u> counting active road right-of-ways) less than 10% of the total riparian area?	<input type="checkbox"/>	<input type="checkbox"/>
d)	Is the total area compacted (disturbed) by animals or machinery in the first 10 m of the riparian area, plus all other compacted areas hydrologically linked to the first 10 m of riparian zone less than 15% of the total riparian area?	<input type="checkbox"/>	<input type="checkbox"/>

If there are any "No" answers, mark the "No" box for Question 11. Otherwise, mark the "Yes" box.

TIP: Sediment deposited on the ground from upslope sources is considered bare ground for Question 11, but not if the sediment is deposited due to flooding (i.e. over-bank deposits).

Sample No. _____

Question 12. Has sufficient vegetation been retained or managed to maintain an adequate root network or LWD supply?		Yes	No	NA
		<input type="checkbox"/>	<input type="checkbox"/>	
a)	On all streams, are all under-story trees taller than 1.3 m, shrubs, and herbaceous vegetation present to the fullest extent possible within 5 m of the stream banks?	<input type="checkbox"/>	<input type="checkbox"/>	
b)	On S1 to S3 size streams, is the first 10 m of the riparian reserve zone intact (regardless of windthrow), thereby providing for 80% or more of the LWD normally supplied to streams with no additional inputs from upstream or the adjacent hillslopes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c)	On S4 streams, where the windthrow hazard was not assessed, or where windthrow hazard was assessed as not high, are all windfirm trees with roots embedded in the bank, and 50% of all other trees (excluding dominant conifers) within 10 m of the stream banks still present?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d)	On S4 streams, where the windthrow hazard was assessed as high, are all under-story trees taller than 1.3 m present within 10 m of the stream banks, to the fullest extent possible?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e)	On valley bottom S5 streams with alluvial banks and a floodplain, are 50% of dominant and codominant windfirm stems within 30 m of the stream banks still present?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f)	On non-valley, LWD dependent S5 streams, are all leaners within 10 m of the stream banks and all under-story trees taller than 1.3 m within 5 m of the streambank still present to the fullest extent possible?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g)	On LWD dependent S6 streams, or S6 that flow directly into fish-bearing waters, are at least 10 under-story trees taller than 1.3 m present within 5 m of the stream banks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><i>If there are any "No" answers, mark the "No" box for Question 12. Otherwise, mark the "Yes" box.</i></p>				

TIP: All streams require an answer to indicator statement 12 (a). At most, only one other indicator statement will be applicable. Right-of-ways should not be considered a factor for Question 12 unless the right-of-ways represent more than 25% of the riparian habitat.

Question 13. Has sufficient vegetation been retained to provide shade and reduce bank microclimate change?		Yes	No
		<input type="checkbox"/>	<input type="checkbox"/>
a)	With the exception of active roads at stream crossings, is the bare erodible ground directly exposed to rain less than 1% of the riparian area?	<input type="checkbox"/>	<input type="checkbox"/>
b)	Does shade (the average amount of sky not visible due to vegetation) average more than 60%, as estimated visually for any two of the east, south and west aspects at 60° above the horizontal?	<input type="checkbox"/>	<input type="checkbox"/>
c)	Are moisture loving macrophytes, mosses, ferns or other bryophytes present and in vigorous condition, with no indication of stress due to sunburn, drought or desiccation?	<input type="checkbox"/>	<input type="checkbox"/>
d)	Is the soil in the riparian habitat cool and moist to the touch?	<input type="checkbox"/>	<input type="checkbox"/>
<p><i>If there are 3 or more "Yes" answers, mark the "Yes" box for Question 13. Otherwise, mark the "No" box.</i></p>			

Sample No. _____

Question 14. Have the number of disturbance-increaser species, noxious weeds, and/or invasive plant species present been limited to a satisfactory level?		Yes	No
a)	Do disturbance-increaser plants (domestic grasses, dandelions, pineapple weed, buttercups, etc.) occupy less than 25% of total area in the first 10 m of the riparian zone?	<input type="checkbox"/>	<input type="checkbox"/>
b)	Do noxious weeds and/or other invasive plant species occupy less than 5% of total area in the first 10 m of the riparian area?	<input type="checkbox"/>	<input type="checkbox"/>
<i>If there are any "No" answers, mark the "No" box for Question 14. Otherwise, mark the "Yes" box.</i>			

TIP: To estimate coverage by disturbance-increaser plants or weeds and other invasive plants at a sample site, record the percentage of two 10 m long line transect (one on each side of the stream) that is occupied by these plants. Start the line transects at the edge of the stream and go 10 m at right angles to the main axis of the stream reach.

Question 15. Is the riparian vegetation and forest structure within the first 10 m from the edge of the stream generally characteristic of what the healthy unmanaged riparian plant community would normally be along the reach?		Yes	No
a)	Are all the major vegetation layers and structural components of the expected healthy unmanaged riparian plant community (e.g. snags, CWD, gaps, tall trees, understory, tall shrubs, low shrubs, herbaceous plants, mosses and lichens) adequately represented? Adequate representation is 1) the presence of all expected layers and components over 75% of the reach, 2) 75% of the expected layers or components over all of the reach, or 3), any combination of 1) and 2) that collectively averages 75% or more.	<input type="checkbox"/>	<input type="checkbox"/>
b)	Do the major vegetation layers and structural components of the expected healthy unmanaged riparian plant community exhibit good vigor, normal growth form, and satisfactory recruitment? Vigor or growth form is poor if plants are discolored, defoliated, brittle, burned, broken, heavily browsed, "mushroomed", wind thrown, harvested or dead. Mark "No" if collectively less than 75% of all the plants and structural components expected show good vigor, form, and recruitment.	<input type="checkbox"/>	<input type="checkbox"/>
c)	Is heavy browse absent? Heavy browse on a plant is browse down to second year wood over most (>50% of the branches) of the plant.	<input type="checkbox"/>	<input type="checkbox"/>
d)	Is 90% or more of the available grazing area free of heavy grazing? Heavy grazing is defined as less than the recommended target stubble height for the dominant forage species present.	<input type="checkbox"/>	<input type="checkbox"/>
<i>If there are 3 or more "Yes" answers, mark the "Yes" box for Question 15. Otherwise, mark the "No" box.</i>			

TIP: All four statements can always be answered "Yes" or "No". There are no NA statements.

TIP: If more than 25% of the total reach length is more or less bare of vegetation, as could be the case at road crossings, then 15(a) and 15(b) should probably be marked "No". If more than 25% of all the vegetation along both sides of the total reach length is removed, as would be the case for a complete clearcut along the reach, then 15(a) and 15(b) would again be marked "No".

TIP: The answer to Q15(c) on browse is "No" if even one plant shows heavy browse. Please refer to the riparian protocol for a description of heavy browse.

Sample No. _____

Summary		Yes	No	NA
Question 1.	Is the channel bed undisturbed?	<input type="checkbox"/>	<input type="checkbox"/>	
Question 2.	Are the channel banks intact?	<input type="checkbox"/>	<input type="checkbox"/>	
Question 3.	Are channel LWD processes intact?	<input type="checkbox"/>	<input type="checkbox"/>	
Question 4.	Is the channel morphology intact?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Question 5.	Are all aspects of the aquatic habitat sufficiently connected to allow for normal, unimpeded movements of fish, organic debris, and sediments?	<input type="checkbox"/>	<input type="checkbox"/>	
Question 6.	Does the stream support a good diversity of fish cover attributes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Question 7.	Does the amount of moss present on the substrates indicate a stable and productive system?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Question 8.	Has the introduction of fine sediments been minimized?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Question 9.	Does the stream support a diversity of aquatic invertebrates?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Question 10.	Has the vegetation retained in the RMA been sufficiently protected from windthrow?	<input type="checkbox"/>	<input type="checkbox"/>	
Question 11.	Has the amount of bare erodible ground or soil compaction in the riparian area been minimized?	<input type="checkbox"/>	<input type="checkbox"/>	
Question 12.	Has sufficient vegetation been retained to maintain an adequate root network or LWD supply?	<input type="checkbox"/>	<input type="checkbox"/>	
Question 13.	Has sufficient vegetation been retained to provide shade and reduce bank microclimate change?	<input type="checkbox"/>	<input type="checkbox"/>	
Question 14.	Have the number of disturbance-increaser plants, noxious weeds and/or invasive plant species present been limited to a satisfactory level?	<input type="checkbox"/>	<input type="checkbox"/>	
Question 15.	Is the riparian vegetation within the first 10m from the edge of the stream generally characteristic of what the healthy unmanaged riparian plant community would normally be along the reach?	<input type="checkbox"/>	<input type="checkbox"/>	
# of "Yes" answers: _____ + # of "No" answers: _____ + # of "NA" answers: _____ = Total # of answers: _____				
Conclusion on Functioning Condition (check one):		<input type="checkbox"/> Properly Functioning (0-2 "No's")	<input type="checkbox"/> Functioning but at Risk (3-4 "No's")	
		<input type="checkbox"/> Functioning but at High Risk (5-6 "No's")	<input type="checkbox"/> Not Properly Functioning (>6 "No's")	

List the questions that had a "No" answer below, and check what you believe was the main reason(s) for the problem. A "No" answer due to natural causes would include any natural events such as insects, fires, floods, slides, diseases etc. that were clearly unrelated to man's activities in the stream or adjacent riparian area. Check Logging, Livestock, Roads or Other Manmade as a cause if these factors directly affected the stream or riparian area assessed in this evaluation. Check Upstream Factors if the "No" answer was the result of some event or condition that occurred upstream, regardless if it was manmade or natural.

"No" answer questions	Causes of "No" Answers						
	Current Logging	Old Logging	Livestock	Roads	Other Manmade	Natural Events	Upstream Factors
	<input type="checkbox"/>						
	<input type="checkbox"/>						
	<input type="checkbox"/>						
	<input type="checkbox"/>						
	<input type="checkbox"/>						

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 <u>and</u> 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															

Sample No. _____

Final Comments

Does the conclusion on functioning condition generally agree with your personal opinion on the functioning condition of this stream reach? If not, please describe why not.

Yes **No**

All "No" answers are weighted equally. Were any specific problems identified that affected the assessment more than others?

Yes **No**

Were there any notable management practices prescribed and implemented on this stream? If so, please describe and comment on their effectiveness.

Yes **No**

Is the sample reach a potential "Reference Stream" with no impacts in the reach due to human activity beside the reach and little human related activity in the watershed area upstream of the sample reach?

Yes **No**

Were any invasive plants observed? Remember to complete an Invasive Plant field card if the answer is "Yes".

Yes **No**

Draw a map of the stream and illustrate the retention and location of other significant features present (e.g. roads, crossings, slides). Also mark the stream assessed on a map in a way that will be legible when scanned.