

## **Appendix H**

### **Fish Habitat Survey Data Sheets**





River: Winter Creek pl

VALLEY SLOPE	BANK HEIGHT (m)	FLOOD PLAIN WIDTH (m)	SHADE (%)	STREAM BANKS										O <sub>2</sub> (Mg/l)	pH	WATER TEMP. °C	FISH SPECIES	POOL RATING		POOL TAIL			% TURBULENCE
				VEGETATION (%)				EROSION (%)										NO.	LETTER	EMBEDDEDNESS (CRITERIA) 1: <20% 2: 20% - 35% 3: 35% ≥ 50% 4: >50%	MEAN SUBSTRATE SIZE (cm)	% FINES	
				BARE GROUND	GRASSES	SHRUBS	TREES	LEFT BANK (0-50%)			RIGHT BANK (0-50%)												
								STABLE	BARE STABLE	ERODING	STABLE	BARE STABLE	ERODING										
L	0.5	10	70	0	20 (moss)	30	50	50	0	0	50	0	0										
L	0.5	10	60	0	20 (moss)	30	50	50	0	0	50	0	0										
L	0.5	10	70	10	50 (moss)	20	30	45	5	0	50	0	0										
L	0.5	10	60	10	50 (moss)	20	30	50	0	0	50	0	0										
L	0.5	10	70	10	50 (moss)	20	30	50	0	0	50	0	0										
L	0.5	10	40	5	50 (moss)	20	25	50	0	0	50	0	0										
L	0.5	10	40	5	50 (moss)	20	25	50	0	0	50	0	0										
L	0.5	10	40	10	50 (moss)	20	25	50	0	0	50	0	0										
L	0.5	10	60	5	25 (moss)	20	50	50	0	0	50	0	0										
L	0.5	10	60	10	10 (moss)	20	60	50	0	0	50	0	0										
L	0.5	10	60	20	0 (moss)	30	60	50	0	0	50	0	0										
L	0.5	10	60	10	10 (moss)	20	60	50	0	0	50	0	0										
L	0.5	10	60	10	10 (moss)	20	60	50	0	0	50	0	0										
L	0.8	10	40	10	10 (moss)	20	60	50	0	0	50	0	0										
L	0.8	20	30	10	30 (moss)	30	30	50	0	0	45	5	0										

NOTE: \* For selected site study, these columns (reverse side) should be done for a habitat assessment

WATER FLOW MEASUREMENT

RIFFLE GRADIENT			UNIT No.	STREAM TYPE	WET WIDTH (m)	DEPTH (cm)			AVERAGE DEPTH SUM / 4		COEFFICIENT (0.9 - smooth) (0.8 - rough)	LENGTH (3m)	FLOAT TIME (sec)				FLOW Cms
LENGTH M	DROP M	GRADIENT %				1/4 way	1/2 way	3/4 way	CENTIMETERS	METERS (m)			1/4 way	1/2 way	3/4 way	AVERAGE	
			5	3	0.6	7.5	10	7	8.2	0.082	0.8	1	5.93	4.82	5.43	5.39	0.007

Formula (CMS) =  $\frac{W \times D \times A \times L}{T}$

Where: W = width, D = depth, L = length, A is a coefficient for the stream bottom

CRITERIA:

- Chute: water depth equal to or greater than channel width
- Riffle: GR/RB - is a riffle flowing over a gravel and/or rubble bottom  
R/B - is a riffle flowing over & through large substrates (eg. rock and /or boulder), some of which protrudes the surface
- Side channels - treat as a separate stream type
- Undercut Bank - % of bank overhang (above water edge for stream type. Specify left (L) or right (R)
- Over-hanging Bank Vegetation - % of vegetation overhang for stream type. Specify L or R
- Visual Embeddedness - % of sands or fines surrounding the larger substrates up to 100%
- Woody Debris - total width should be >10 cm in diameter

A= 0.8 for rough bottom

06-00

**DNR&E / DFO - NEW BRUNSWICK  
STREAM SURVEY and HABITAT ASSESSMENT**

\_2 of \_3

River: Winter Creek  
Personnel: SC

Start Point:                      End Point                      :  
Date: September 8<sup>th</sup> & 9<sup>th</sup>, 2004

Stream/River No.  
Stream Order No.

UNIT NO.	STREAM TYPE	CHANNEL TYPE	CHAINAGE END	LENGTH (m)	AVE WIDTH (m)		SUBSTRATE (%)							AVE DEPTH - WET WIDTH (cm)	0-50% UNDERCUT BANK		0-50% OVER-HANGING BANK VEGETATION		LARGE WOODY DEBRIS IN STREAM (m)	EMBEDDEDNESS (CRITERIA) 1: <20% 2: 20% - 35% 3: 35% ≥ 50% 4: >50%	INSTREAM VEGETATION	COMMENTS
					WET	BANK CHANNEL	BEDROCK	BOULDER	ROCK	RUBBLE	GRAVEL	SAND	FINES		L	R	L	R				
16	3/16	1	471	20	1.2	2	0	10	10	40	20	10	0	10/20	0	0	0	0	1	2	N	
17	3	1	497	26	0.8	1.5	0	0	20	40	20	10	10	15	0	0	0	5	0	3	N	
18	16	1	506	9	2	2	0	0	10	40	30	10	10	20	0	10	10	10	0	3	N	
19	3	1	509	3	0.8	1	0	0	10	50	20	10	10	10	0	10	0	0	0	3	N	
20	10	1	513	4	1.4	2	0	0	10	50	20	10	10	20	10	0	0	0	0	3	N	
21	3	1	516	3	1	1.2	0	0	10	50	20	10	10	10	0	0	0	0	0	3	N	
22	10	1	523	7	1	1	0	0	10	50	20	10	10	25	10	0	0	0	0	3	N	
23	3/10	1	535	12	1	2	0	0	10	60	10	10	10	10-25	0	0	5	10	0	3-4	N	
24	3/16	1	547	12	1.5	2	0	0	10	60	20	10	0	10-25	0	0	0	0	0.5	3	N	
25	16	1	563	16	1.5	2	0	0	0	40	20	20	20	20	5	5	10	20	3	3	N	
26	16	1	587	24	1.5	2	0	0	0	40	20	20	20	20	5	5	50	50	2	3	N	
27	3/16	1	606	19	0.8	1	0	0	20	30	0	20	30	20	0	0	20	20	0.5	3	N	
28	3/16	1	650	44	0.5-1.0	1	0	0	30	25	0	25	20	10-20	0	0	30	30	1	3	N	
29	3	1	665	15	1	2.5	0	0	10	40	0	20	30	15	0	0	10	0	0	4	N	
30	3/16	1	701	36	1	1.5	0	5	40	35	0	0	20	5-25	5	5	10	20	1	3	N	

STREAM TYPE				CHANNEL TYPE				SUBSTRATE	FLOW TYPE	POOL RATING (reverse side)	
FASTWATER		POOLS								CRITERIA (NO.)	% OF POOLS IN SITE (LETTER)
1. Fall	6. Sheet (ledge)	10. Midchannel	14. Trench	18. Eddy	22. Wood Debris	1. Main (if measurement refers to main area of river)		1. Bedrock , Ledge	1. Survey Stream	Pool Depth ≥ 1.5 m	a - ≥ 30%
2. Cascade	7. Chute	11. Convergence	15. Plunge	19. Gabion	23. Man-Made Dam	* 2. Side Channel (water diverted by islands)		2. Boulder = > 461 mm	2. Spring	1 - Instream Cover ≥ 30%	b - ≥ 10% to 30%
3. Riffle (GR/RB)	8. Run	12. Lateral	16. Flatwater	20. Log Structure	24. Natural Deadwater	* 3. Split (if river is split into various different stream types)		3. Rock = 180 - 460 mm	3. Brook/River Trib	2 - Instream Cover < 30%	c - < 10%
4. Riffle (R/B)	9. Rapid	13. Beaver	17. Bogan	21. Road Crossing		* 4. Bogan		4. Rubble = 54 - 179 mm	4. Spring Seep	Pool Depth .5 to 1.5m	a - ≥ 50%
5. Riffle (Sand)						* - Specify Left (L), Right (R) or Middle (M)		5. Gravel = 2.6 - 53 mm		3 - Instream Cover 5 - 30%	b - < 50%
								6. Sand = 0.06 - 2.5 mm		4 - Instream Cover > 30%	
								7. Fines = 0.0005 - 0.05 mm			

River: Winter Creek

VALLEY SLOPE	BANK HEIGHT (m)	FLOOD PLAIN WIDTH (m)	SHADE (%)	STREAM BANKS											O <sub>2</sub> (Mg/l)	pH	WATER TEMP. °C	FISH SPECIES	POOL RATING		POOL TAIL			% TURBULENCE
				VEGETATION (%)				EROSION (%)											NO.	LETTER	EMBEDDEDNESS (CRITERIA) 1: <20% 2: 20% - 35% 3: 35% ≥ 50% 4: >50%	MEAN SUBSTRATE SIZE (cm)	% FINES	
				BARE GROUND	GRASSES	SHRUBS	TREES	LEFT BANK (0-50%)			RIGHT BANK (0-50%)													
								STABLE	BARE STABLE	ERODING	STABLE	BARE STABLE	ERODING											
L	0.8	20	60	10	30	20	40	50	0	0	50	0	0											
L	0.8	20	20	10	30	10	50	50	0	0	50	0	0											
L	0.5	20	60	0	30	10	60	50	0	0	40	10	0											
L	0.5	20	50	10	30	0	60	50	0	0	30	20	0											
L	0.5	20	50	10	30	0	60	30	20	0	30	20	0											
L	0.50.5	20	50	0	30	10	60	50	0	0	50	0	0											
L	0.5	20	50	0	30	10	60	50	0	0	50	0	0											
L	0.5	20	30	0	20	10	70	50	0	0	50	0	0											
L	0.5	20	30	0	20	10	70	50	0	0	50	0	0											
L	0.5	20	40	0	30	30	40	50	0	0	50	0	0											
L	0.5	20	60	0	0	90	10	50	0	0	50	0	0											
L	0.5	10	60	0	40	50	10	50	0	0	50	0	0											
L	0.8	10	70	0	40	20	40	50	0	0	50	0	0											
L	0.5	10	70	0	10	40	50	50	0	0	50	0	0											
L	0.4	20	50	5	20	15	60	50	0	0	50	0	0											

NOTE: \* For selected site study, these columns (reverse side) should be done for a habitat assessment

WATER FLOW MEASUREMENT

RIFFLE GRADIENT			UNIT No.	STREAM TYPE	WET WIDTH (m)	DEPTH (cm)			AVERAGE DEPTH SUM / 4		COEFFICIENT (0.9 - smooth) (0.8 - rough)	LENGTH (3m)	FLOAT TIME (sec)				FLOW Cms	
LENGTH M	DROP M	GRADIENT %				1/4 way	1/2 way	3/4 way	CENTIMETERS	METERS (m)			1/4 way	1/2 way	3/4 way	AVERAGE		

Formula (CMS) =  $\frac{W}{T} \times D \times A \times L$  Where: W = width, D = depth, L = length, A is a coefficient for the stream bottom

CRITERIA:	<ol style="list-style-type: none"> <li>Chute: water depth equal to or greater than channel width</li> <li>Riffle: GR/RB - is a riffle flowing over a gravel and/or rubble bottom RB - is a riffle flowing over &amp; through large substrates (eg. rock and /or boulder), some of which protrudes the surface</li> <li>Side channels - treat as a separate stream type</li> <li>Undercut Bank - % of bank overhang (above water edge for stream type. Specify left (L) or right (R))</li> <li>Over-hanging Bank Vegetation - % of vegetation overhang for stream type. Specify L or R</li> <li>Visual Embeddedness - % of sands or fines surrounding the larger substrates, up to 100%</li> <li>Woody Debris - total width should be &gt;10 cm in diameter</li> </ol>
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A= 0.8 for rough bottom

06-00

**DNR&E / DFO - NEW BRUNSWICK  
STREAM SURVEY and HABITAT ASSESSMENT**

3 of 3

River: Winter Creek  
Personnel: SC

Start Point: \_\_\_\_\_ End Point: \_\_\_\_\_  
Date: September 8<sup>th</sup> & 9<sup>th</sup>, 2004

Stream/River No. \_\_\_\_\_  
Stream Order No. \_\_\_\_\_

UNIT NO.	STREAM TYPE	CHANNEL TYPE	CHAINAGE END	LENGTH (m)	AVE WIDTH (m)		SUBSTRATE (%)							AVE DEPTH - WET WIDTH (cm)	0-50% UNDERCUT BANK		0-50% OVER-HANGING BANK VEGETATION		LARGE WOODY DEBRIS IN STREAM (m)	EMBEDDEDNESS (CRITERIA) 1: <20% 2: 20% - 35% 3: 35% ≥ 50% 4: >50%	INSTREAM VEGETATION	COMMENTS		
					WET	BANK CHANNEL	BEDROCK	BOULDER	ROCK	RUBBLE	GRAVEL	SAND	FINES		L	R	L	R						
31	3	1	708	7	0.8	1.2	0	0	60	30	0	0	10	10	0	0	5	5	0	2	2	Stream gradient increases		
32	10	1	714	6	2	2	0	0	50	30	0	0	20	30	0	0	5	5	0	3	3			
33	3	1	734	20	0.8	1	0	0	60	10	0	0	10	20	5	0	30	0	0.5	2	2			
34	10	1	745	11	1	1	0	0	50	30	0	0	20	35	0	0	5	5	0	3	3			
35	3	1	762	17	0.8	1.2	0	0	60	20	0	0	20	20	0	0	5	5	1	3	3			
36	3	1	799	37	0.8	1	0	0	60	20	0	0	20	15	0	0	20	10	0.4	3	3			
37	24	1	841	42	2	2.5	0	0	20	30	0	10	40	80	0	0	30	20	1.5	4	4	Stream opens up into bog area		

STREAM TYPE				CHANNEL TYPE			SUBSTRATE		FLOW TYPE		POOL RATING (reverse side)	
FASTWATER		POOLS									CRITERIA (NO.)	% OF POOLS IN SITE (LETTER)
1. Fall	6. Sheet (ledge)	10. Midchannel	14. Trench	18. Eddy	22. Wood Debris	1. Main (if measurement refers to main area of river)		1. Bedrock / Ledge	1. Survey Stream		Pool Depth ≥ 1.5 m	a - ≥ 30% b - ≥ 10% to 30% c - < 10%
2. Cascade	7. Chute	11. Convergence	15. Plunge	19. Gabion	23. Man-Made Dam	* 2. Side Channel (water diverted by islands)		2. Boulder = > 461 mm	2. Spring		1 - Instream Cover ≥ 30%	
3. Riffle (GR/RB)	8. Run	12. Lateral	16. Flatwater	20. Log Structure	24. Natural Deadwater	* 3. Split (if river is split into various different stream types)		3. Rock = 180 - 460 mm	3. Brook/River Trib		2 - Instream Cover < 30%	
4. Riffle (R/B)	9. Rapid	13. Beaver	17. Bogan	21. Road Crossing		* 4. Bogan		4. Rubble = 54 - 179 mm	4. Spring Seep		Pool Depth .5 to 1.5m	a - ≥ 50% b - < 50%
5. Riffle (Sand)						* - Specify Left (L), Right (R) or Middle (M)		5. Gravel = 2.6 - 53 mm			3 - Instream Cover 5 - 30%	
								6. Sand = 0.06 - 2.5 mm			4 - Instream Cover > 30%	
								7. Fines = 0.0005 - 0.05 mm				

River: Winter Creek p3

VALLEY SLOPE	BANK HEIGHT (m)	FLOOD PLAIN WIDTH (m)	SHADE (%)	STREAM BANKS											O <sub>2</sub> (Mg/l)	pH	WATER TEMP. °C	FISH SPECIES	POOL RATING		POOL TAIL			% TURBULENCE	
				VEGETATION (%)				EROSION (%)						NO.					LETTER	EMBEDDEDNESS (CRITERIA) 1: <20% 2: 20% - 35% 3: 35% ≥ 50% 4: >50%	MEAN SUBSTRATE SIZE (cm)	% FINES			
				BARE GROUND	GRASSES	SHRUBS	TREES	LEFT BANK (0-50%)			RIGHT BANK (0-50%)														
								STABLE	BARE STABLE	ERODING	STABLE	BARE STABLE	ERODING												
L	0.4	10	40	0	30	10	60	50	0	0	50	0	0												
L	0.4	10	30	0	30	20	50	50	0	0	50	0	0												
L	0.6	10	40	0	20	40	40	50	0	0	45	0	0												
L	0.6	10	30	0	30	40	30	50	0	0	50	0	0												
L	0.6	10	30	0	20	60	20	50	0	0	50	0	0												
L	0.6	15	40	0	20	50	30	50	0	0	50	0	0												
L	0.4	40	10	0	30	60	10	50	0	0	50	0	0												

NOTE: \* For selected site study, these columns (reverse side) should be done for a habitat assessment

WATER FLOW MEASUREMENT

RIFFLE GRADIENT			UNIT No.	STREAM TYPE	WET WIDTH (m)	DEPTH (cm)			AVERAGE DEPTH SUM / 4		COEFFICIENT (0.9 - smooth) (0.8 - rough)	LENGTH (3m)	FLOAT TIME (sec)				FLOW Cms
LENGTH M	DROP M	GRADIENT %				1/4 way	1/2 way	3/4 way	CENTIMETERS	METERS (m)			1/4 way	1/2 way	3/4 way	AVERAGE	

Formula (CMS) =  $\frac{W}{T} \times D \times A \times L$  (m) x A (m) x L (m) / T (sec) Where: W = width, D = depth, L = length, A is a coefficient for the stream bottom

CRITERIA:	<ol style="list-style-type: none"> <li>Chute: water depth equal to or greater than channel width</li> <li>Rifle: GR/RB - is a riffle flowing over a gravel and/or rubble bottom RB - is a riffle flowing over &amp; through large substrates (eg. rock and/or boulder), some of which protrudes the surface</li> <li>Side channels - treat as a separate stream type</li> <li>Undercut Bank - % of bank overhang (above water edge for stream type. Specify left (L) or right (R))</li> <li>Over-hanging Bank Vegetation - % of vegetation overhang for stream type. Specify L or R</li> <li>Visual Embeddedness - % of sands or fines surrounding the larger substrates, up to 100%</li> <li>Woody Debris - total width should be &gt;10 cm in diameter</li> </ol>
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A= 0.8 for rough bottom



06-00

**DNR&E / DFO - NEW BRUNSWICK  
STREAM SURVEY and HABITAT ASSESSMENT**

1 of 2

River: Winter Creek Tributary

Start Point: at ATV crossing

End Point : upstream at ATV crossing into bog

Personnel: SC

Date: September 8<sup>th</sup>, 2004

Stream/River No.  
Stream Order No.

UNIT NO.	STREAM TYPE	CHANNEL TYPE	CHAINAGE END	LENGTH (m)	AVE WIDTH (m)		SUBSTRATE (%)							AVE DEPTH - MEAN WIDTH (cm)	0-50% UNDERCUT BANK		0-50% OVER-HANGING BANK VEGETATION		LARGE WOODY DEBRIS IN STREAM (m)	EMBEDDEDNESS (CRITERIA) 1: <20% 2: 20% - 35% 3: 35% ≥ 50% 4: >50%	INSTREAM VEGETATION	COMMENTS
					WET	BANK CHANNEL	BEDROCK	BOULDER	ROCK	RUBBLE	GRAVEL	SAND	FINES		L	R	L	R				
1	24	1	16	16	0.8				5	10	5	30	50	10	0	0	20	10	1	3-4	Yes	Hard bottom under couple inches of muck ATV trail @ 104m u/s of start pt.
2	Under ground flow	Covered with moss and wispy grasses from 70-104 no fish habitat	50	34																		Unit 3 discontinuous water with stagnant ponds
3	24	1	64	14	0.8	0.8			20			30	50		10	10	40	20	3	4	Yes	Headwater stream characteristics - ponding water shallow flow
4	24/3	1	66	2	1.0	1.0			20			30	50	20	10	10	30	40	3	3-4	No	Very boggy riparian area on Right Bank
5	3/8	1	120	54	0.4	0.5			40		10	20	30	10	0	0	50	50	0	3	No	Heavily vegetated with shrubs over channel
6	24	1	20		1.5	1.5	0	0	10	40	30	20	0	0.6	0	0	0	0	0	2	No	It is actually a distinct ATV trail that has been flooded by slow water
7	5	1	40		0.3	0.3					20	30	50	10	0	0	5	5	1	3	No	Hard Bottom under 2 inches of muck
8	24	1	52		1.0	1.5					20	30	50	10	0	0	5	5	1	3	No	Hard Bottom under 2 inches of muck
9	Under ground flow		62																			Flows Underground
10	5	1	70		0.4	0.5	0		30	10		20	40	10	0	0	0	0	2	2	No	
11	5/24	1	79		1.2	1.2		5	30			30	35	20	0	0	0	0	0.5	3	No	
12	dry	1	83		0.4	0.4			20	40	20	20			0	0	0	0	0	dry	No	
13	5/24	1	95		0.8	1.0			10	10	20	30	30	15	0	0	0	0	0.1	3	No	
14	3	1	120		0.8	1.0		10	20	25		15	30	15	0	0	0	0	0	3	No	At 109 m small natural dam on stream
15	24	1	153		1.0	1.2			5			30	50	10	0	0	0	0	0		No	

STREAM TYPE				CHANNEL TYPE				SUBSTRATE				FLOW TYPE		POOL RATING (reverse side)	
FASTWATER		POOLS												CRITERIA (NO.)	% OF POOLS IN SITE (LETTER)
1. Fall	6. Sheet (ledge)	10. Midchannel	14. Trench	18. Eddy	22. Wood Debris	1. Main (if measurement refers to main area of river)				1. Bedrock, Ledge	1. Survey Stream		Pool Depth ≥ 1.5 m		a - ≥ 30% b - ≥ 10% to 30% c - < 10%
2. Cascade	7. Chute	11. Convergence	15. Plunge	19. Gabion	23. Man-Made Dam	* 2. Side Channel (water diverted by islands)				2. Boulder = > 461 mm	2. Spring		1 - Instream Cover ≥ 30%		
3. Riffle (GR/RB)	8. Run	12. Lateral	16. Flatwater	20. Log Structure	24. Natural Deadwater	* 3. Split (if river is split into various different stream types)				3. Rock = 180 - 460 mm	3. Brook/River Trib		2 - Instream Cover < 30%		
4. Riffle (R/B)	9. Rapid	13. Beaver	17. Bogan	21. Road Crossing		* 4. Bogan				4. Rubble = 54 - 179 mm	4. Spring Seep		3 - Instream Cover 5 - 30%		a - ≥ 50% b - < 50%
5. Riffle (Sand)						* - Specify Left (L), Right (R) or Middle (M)				5. Gravel = 2.6 - 53 mm			4 - Instream Cover > 30%		
										6. Sand = 0.06 - 2.5 mm					
										7. Fines = 0.0005 - 0.05 mm					

River: Winter Creek Tributary

VALLEY SLOPE	BANK HEIGHT (m)	FLOOD PLAIN WIDTH (m)	SHADE (%)	STREAM BANKS										O <sub>2</sub> (Mg/l)	pH	WATER TEMP. °C	FISH SPECIES	POOL RATING		POOL TAIL			% TURBULENCE
				VEGETATION (%)				EROSION (%)										NO.	LETTER	EMBEDDEDNESS (CRITERIA) 1: <20% 2: 20% - 35% 3: 35% ≥ 50% 4: >50%	MEAN SUBSTRATE SIZE (cm)	% FINES	
				BARE GROUND	GRASSES	SHRUBS	TREES	LEFT BANK (0-50%)			RIGHT BANK (0-50%)												
								STABLE	BARE STABLE	ERODING	STABLE	BARE STABLE	ERODING										
L	0.3	15	80		30	30	40	50				50				No fish in U/S section							
L	0.3	15	80		30	30	40	50				50											
L	0.3	20	60		60	10	30	50				50											
L	0.3	20	80		30	30	40	50				50											
L	0.3	20	90		30	60	10	50				50											
L	0.8	20	0		85	5	10	50	0	0	50	0	0	0									
L	0.3	10	70		0	50	30	20	50	0	0	50	0	0									
L	0.3	10	60		0	30	30	40	50	0	0	50	0	0									
L			100		flows	under	ground																
L	0.1	10	40		10	30	10	50	0	0	50	0	0										
L-M	0.5	5	40		10	30	20	40	50			50											
M	0.5	8	40		10	30	20	40	50			50											
M	0.5	8	30		0	30	30	40	50			50											
M	0.5	8	20		0	25	25	50	50			50											
M	0.5	8	40		20	30	20	30	50			50											

NOTE: \* For selected site study, these columns (reverse side) should be done for a habitat assessment

WATER FLOW MEASUREMENT

RIFFLE GRADIENT			UNIT No.	STREAM TYPE	WET WIDTH (m)	DEPTH (cm)			AVERAGE DEPTH SUM / 4		COEFFICIENT (0.9 - smooth) (0.8 - rough)	LENGTH (3m)	FLOAT TIME (sec)				FLOW Cms
LENGTH M	DROP M	GRADIENT %				1/4 way	1/2 way	3/4 way	CENTIMETERS	METERS (m)			1/4 way	1/2 way	3/4 way	AVERAGE	

Formula (CMS) =  $\frac{W}{T} \times D \times A$  (m) x A (m) x L (m) / T (sec) Where: W = width, D = depth, L = length, A is a coefficient for the stream bottom

CRITERIA:	
1. Chute: water depth equal to or greater than channel width 2. Riffle: GR/RB - is a riffle flowing over a gravel and/or rubble bottom R/B - is a riffle flowing over & through large substrates (eg. rock and /or boulder), some of which protrudes the surface 3. Side channels - treat as a separate stream type	4. Undercut Bank - % of bank overhang (above water edge for stream type. Specify left (L) or right (R)) 5. Over-hanging Bank Vegetation - % of vegetation overhang for stream type. Specify L or R 6. Visual Embeddedness - % of sands or fines surrounding the larger substrates, up to 100% 7. Woody Debris - total width should be >10 cm in diameter

A= 0.8 for rough bottom

DNR&E / DFO - NEW BRUNSWICK  
 STREAM SURVEY and HABITAT ASSESSMENT

River: Winter Creek Tributary

Start Point: At ATV crossing

End Point : upstream at ATV crossing into bog

Personnel: SC

Date: September 8<sup>th</sup>, 2004

Stream/River No.  
 Stream Order No.

UNIT NO.	STREAM TYPE	CHANNEL TYPE	CHAINAGE END	LENGTH (m)	AVE WIDTH (m)		SUBSTRATE (%)							AVE DEPTH - WET WIDTH (cm)	0-50% UNDERCUT BANK		0-50% OVER-HANGING BANK VEGETATION		LARGE WOODY DEBRIS IN STREAM (m)	EMBEDDEDNESS (CRITERIA) 1: <20% 2: 20% - 35% 3: 35% ≥ 50% 4: >50%	INSTREAM VEGETATION	COMMENTS		
					WET	BANK CHANNEL	BEDROCK	BOULDER	ROCK	RUBBLE	GRAVEL	SAND	FINES		L	R	L	R						
16	5/24	1	246		0.8	0.8				5		15	20	50	10-20	0	0	0	0		Not a flowing channel	No		
17	Moist mud	1	271			1.0								100		0	0	0	0	0	4	No	Flows underground in some areas - hard to follow	
18	24	1	302		0.8	1.0			10	10			10	70		0	0	0	0	3-4	No	At 302 m flows underground to 308 m		
19	Under ground		308	Flows	Under	Ground												0	0	4	No	Flows underground		
20	0												At 355 m	Hits	Winter	Creek								

STREAM TYPE				CHANNEL TYPE				SUBSTRATE				FLOW TYPE		POOL RATING (reverse side)	
FASTWATER		POOLS												CRITERIA (NO.)	% OF POOLS IN SITE (LETTER)
1. Fall	6. Sheet (ledge)	10. Midchannel	14. Trench	18. Eddy	22. Wood Debris	1. Main (if measurement refers to main area of river)		1. Bedrock	Ledge			1. Survey Stream	Pool Depth	≥ 1.5 m	a - ≥ 30%
2. Cascade	7. Chute	11. Convergence	15. Plunge	19. Gabion	23. Man-Made Dam	* 2. Side Channel (water diverted by islands)		2. Boulder	=	> 461 mm	2. Spring	1 - Instream Cover	≥ 30%	b - ≥ 10% to 30%	
3. Riffle (GR/RB)	8. Run	12. Lateral	16. Flatwater	20. Log Structure	24. Natural Deadwater	* 3. Split (if river is split into various different stream types)		3. Rock	=	180 - 460 mm	3. Brook/River Trib	2 - Instream Cover	< 30%	c - < 10%	
4. Riffle (R/B)	9. Rapid	13. Beaver	17. Bogon	21. Road Crossing		* 4. Bogon		4. Rubble	=	54 - 179 mm	4. Spring Seep	Pool Depth	.5 to 1.5m	a - ≥ 50%	
5. Riffle (Sand)						* - Specify Left (L), Right (R) or Middle (M)		5. Gravel	=	2.6 - 53 mm		3 - Instream Cover	5 - 30%	b - < 50%	
								6. Sand	=	0.06 - 2.5 mm		4 - Instream Cover	> 30%		
								7. Fines	=	0.0005 - 0.05 mm					

River: Winter Creek Tributary

VALLEY SLOPE	BANK HEIGHT (m)	FLOOD PLAIN WIDTH (m)	SHADE (%)	STREAM BANKS										O <sub>2</sub> (Mg/l)	pH	WATER TEMP. °C	FISH SPECIES	POOL RATING		POOL TAIL			% TURBULENCE			
				VEGETATION (%)				EROSION (%)										NO.	LETTER	EMBEDDEDNESS (CRITERIA) 1: <30% 2: 20% - 35% 3: 35% ≥ 50% 4: >50%	MEAN SUBSTRATE SIZE (cm)	% FINES				
				BARE GROUND	GRASSES	SHRUBS	TREES	LEFT BANK (0-50%)			RIGHT BANK (0-50%)															
								STABLE	BARE STABLE	ERODING	STABLE	BARE STABLE	ERODING													
L	0.8	8	60	5	30	10	55	50				50														
L	0.8	5	70		30 Mosses	0	70	50	0	0	50	0	0													
L	0.8	5	70		30 Mosses	0	70	50	0	0	50	0	0													
L	0	Under ground			60		40																			
L	0.4	5	20		60		40																			

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WATER FLOW MEASUREMENT

RIFLE GRADIENT			UNIT No.	STREAM TYPE	WET WIDTH (m)	DEPTH (cm)			AVERAGE DEPTH SUM / 4		COEFFICIENT (0.9 - smooth) (0.8 - rough)	LENGTH (3m)	FLOAT TIME (sec)				FLOW Cms										
LENGTH M	DROP M	GRADIENT %				1/4 way	1/2 way	3/4 way	CENTIMETERS	METERS (m)			1/4 way	1/2 way	3/4 way	AVERAGE											

Formula (CMS) =  $\frac{W}{T} \times D \times \frac{A}{L}$  Where: W = width, D = depth, L = length, A is a coefficient for the stream bottom

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A= 0.8 for rough bottom