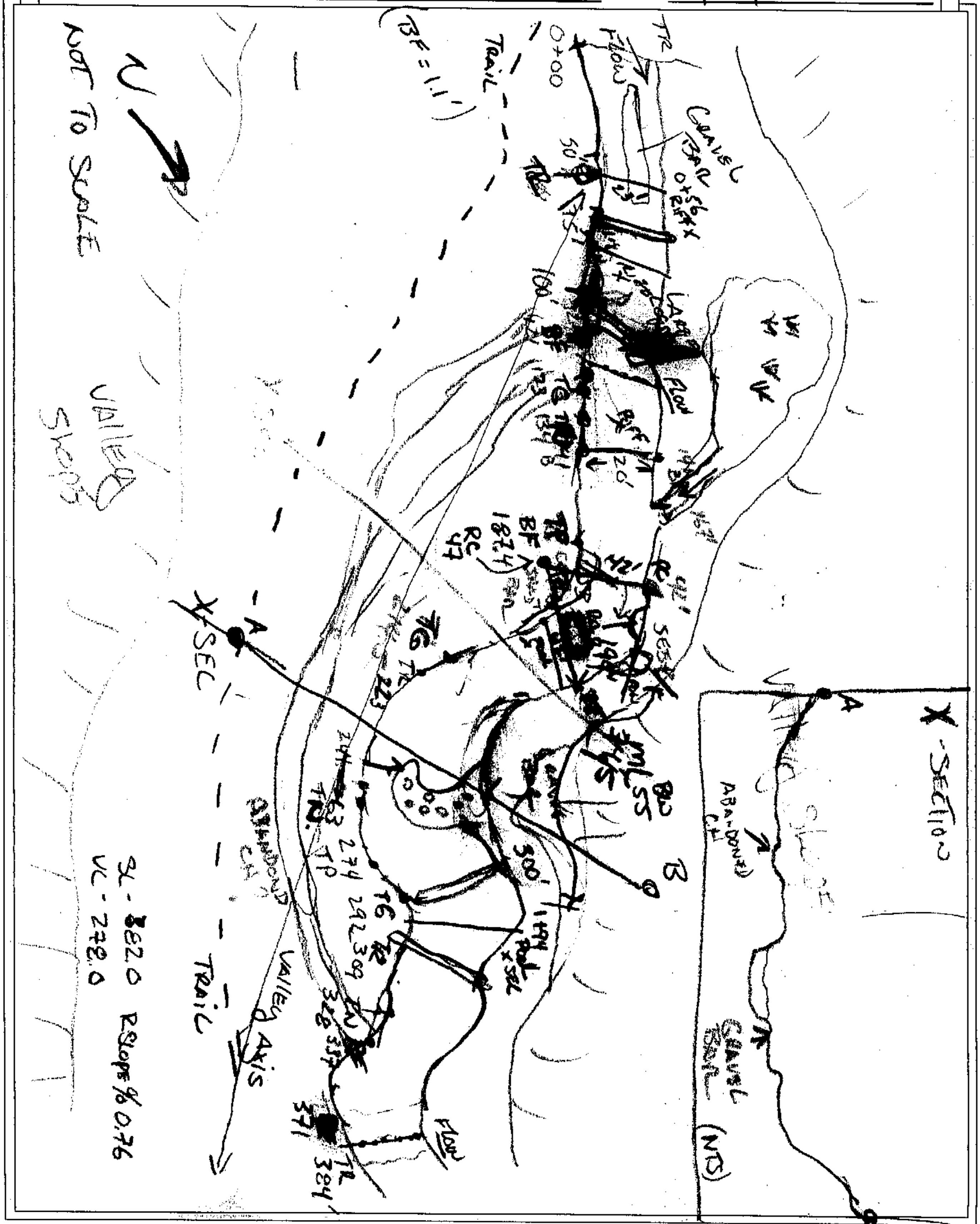
AREA-SITE LOCATION....REACH MAP

Stream: Sweet Run Reach: #3

Drawn By: ______ Date: 3/22/2016



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Geometry Measurements

Stream name/location: Sweet Run

Date: 3/22/16 Team members: John, Keith, Mike

Attribute	Measurement 1	Measurement 2	Measurement 3	Measurement 4	Measurement 5	Range	Average
Radius of Curvature **(R_c)**	42ft 42 ft						
Meander (Linear) Wavelength **(λ)**	72 ft						
Stream Meander Length **(L_m)**	97 ft						
Belt Width **(W_{blt})**	62.5 ft						
Arc Length **(A_L)**	73 ft						

Sinuosity

Stream length = 382 ft
Valley length = 278 ft
Sinuosity = 1.37

Geometry Measurements

Stream name/location: Team 3

Date: 3/22/16 Team members: DANN, STEVE, WHITNEY

Attribute	Measurement 1	Measurement 2	Measurement 3	Measurement 4	Measurement 5	Range	Average
Radius of Curvature **(R_c)**	52						
Meander (Linear) Wavelength **(λ)**	77						
Stream Meander Length **(L_m)**	107						
Belt Width **(W_{blt})**	48						
Arc Length **(A_L)**	96						

Sinuosity

Stream length = 382

Valley length = 278

Sinuosity = 1.37

Field Data Sheet for Discharge Measurements

Stream Discharge Measurement Sheet

Site ID #: SWEET RUN
Name and Location: DOWNSTREAM - Reach 3
Date: 3/24/16 Crew: TEAM 3 - MD, DM, WW

County:
Weather: Sunny, warm
Cross-section Location:
Meter:

Station	Width	Depth	Area (Width x Depth)	Run Length	Secs	Velocity (fs)	Average Velocity Use with 2pt method (0.2+0.8)/2	Discharge (Area x Velocity) (cfs)
10.5	.5	0.1	0.05					
10.0	.5	0.15	0.075					
9.5	.5	0.2	0.1					
9.0	.5	0.25	0.125			0.19		0.02375
8.5	.5	0.3	0.15			0.49		0.0735
8.0	.5	0.39	0.195			0.69		0.13455
7.5	.5	0.43	0.215			0.30		0.0645
7.0	.5	0.52	0.26			0.39		0.1014
6.5	.5	0.55	0.275			0.47		0.12925
6.0	.5	0.65	0.325			0.79		0.25975
5.5	.5	0.75	0.375			0.88		0.33
5.0	.5	0.90	0.45			0.3		0.135
4.5	.5	0.90	0.45			0.32		0.144
4.0	.5	0.90	0.45			0.54		0.243
3.5	.5	0.61	0.305			0.70		0.2135
3.0	.5	0.59	0.295			0.90		0.2655
2.5	.5	0.40	0.20			1.0		0.20
2.0	.5	0.50	0.25			0.64		0.16
1.5	.5	0.37	0.185			0.35		0.06475
1.0	.5							
.5	.5							
0	.5							

2.477

Total Discharge: 2.54 CFS (oMeasured, o Estimated)

Comments:

SURVEY DATA ⟹ **CROSS - SECTION 1** Pool

SITE: Sweet Run **Date:** 22-Mar-16

Location: Reach 3 - pool cross-section

Party / Notes: Team 3 - RS, JW, WW **HUC:**

Item	Distance, Point, or STATION ft	Back-Sight BS ft	Height of Instrument HI ft	Fore-Sight FS ft	Elevation ft	REMARKS / COMMENTS / NOTES
1	BM1	4.15	104.15		100	· For pool cross-section · BM-rebar w/ yellow cap
2	0			4.85		TLB
3	2.8			6.01		MLB
4	4.4			7.02		LEW
5	6.0			7.88		Channel
6	7.0			8.34		Channel
7	8.0			8.68		Channel
8	9.0			9.02		Channel
9	10.0			9.0		Channel
10	11.0			9.24		Thalweg
11	12.0			9.02		Channel
12	13.0			8.98		Channel
13	14.0			8.80		Channel
14	15.0			8.67		Channel
15	16.0			8.17		Channel
16	16.7			8.06		Channel
17	17.5			7.53		Channel
18	18.6			7.20		Channel
19	21.4			7.12		REW
20	22.6			6.89		MRB
21	24.0			6.41		RB
22	27.6			6.44		RB
23	28.8			6.48		RB - Small channel
24	29.9			6.33		Bottom edge of Right bank
25	31.9			5.88		MRB
26	34.6			5.70		TRB
27	37.4			5.80		First terrace
28	39.0			5.98		First terrace

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SURVEY DATA ⟹ **CROSS - SECTION 2**

SITE: Sweet run 0+55 **Date:** March 22 2016

Item	STATION ft	BS ft	HI ft	FS ft	Elevation ft	NOTES COMMENTS REMARKS
29	~~0+55~~					
30	BM	500	105.02		100	
31						
32	0.00			3.87		TOP L BANK
33	2.00			4.08		L BANK
34	4.00			4.47		L BANK
35	5.40			4.88		L BANK
36	6.10			6.76		L BANK
37	7.50			7.55		L EW
38	9.00			7.84		CH
39	10.50			7.88		CH
40	11.90			7.85		CH
41	12.90			7.92		THALWEG
42	14.10			7.89		CH
43	15.60			7.82		CH
44	17.40			7.73		CH
45	18.90			7.70		CH
46	20.70			7.68		CH
47	22.50			7.65		CH
48	23.90			7.57		CH
49	25.40			7.63		CH
50	26.20			7.49		R EW
51	27.30			7.34		R BANK
52	28.20			7.09		R BANK
53	28.90			6.78		R BANK
54	29.50			6.73		R BANK
* 55	30.00			6.67		R BF
56	31.10			6.54		R BANK
57	32.40			6.34		R BANK
58	33.20			6.18		R BANK
59	34.50			4.99		R BANK
	35.30			4.39		R BANK

OVER LOT

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SURVEY DATA ⟹ **CROSS - SECTION 2**

SITE: Sweet Run - Reach 3 - pool cross-section **Date:** 22-Mar-16

Item	STATION ft	B S ft	H I ft	F S ft	Elevation ft	NOTES COMMENTS REMARKS
29	40.0			6.06		Ground - 1st terrace
30	41.2			6.15		Bottom of feature
31	42.9			6.02		Ground
32	45.1			5.45		M of 2nd terrace
33	47.0			5.28		Ground
34	49.6			5.04		T of 2nd terrace
35	BM	1.15		4.15		1 BM - rebar w/yellow cap
36						
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						
48						
49						
50						
51						
52						
53						
54						
55						
56						
57						
58						
59						

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SURVEY DATA ⟶ **LONGITUDINAL PROFILE 1**

SITE: Sweet Run **Date:** 22-Mar-16

Location: Reach 3

Party / Notes: Team 3 - KS, JW, WW **HUC:**

	Distance, Point, or	Back-Sight	Height of Instru-ment	Thalweg		Water Surface		Bankfull		Low Bank HI		NOTES
				Fore-Sight	Elevation	Fore-Sight	Elevation	Fore-Sight	Elevation	Fore-Sight	Elevation	e.g. Riffle Run Pool Glide
	STATION	BS	HI	FS	Elev.	FS	Elev.	FS	Elev.	FS	Elev.	
	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft	
1	BM 1	5.24	105.24								100	
2	0			7.25		6.88		/		4.15		T Riffle
3	0+55.5			8.07		7.69		6.72		4.58		Location of riffle x-section / Bankfull
4	0+77			8.34		7.97		/		4.43		T Run
5	0+96			8.85		8.13		/		4.63		M Run
6	1+07			8.98		8.12		/		4.79		T Pool
7	1+21			10.05		8.19		7.12		7.12		~~T Glide~~ Pool max Depth / Bankfull pt. Max Depth
8	1+23.5			9.55		8.15		7.25		7.25		T Glide
9	1+28			9.33		8.12		/		7.39		M Glide
10	1+34			9.11		8.14		/		6.95		T Run
11	1+40			8.84		8.02		6.86		6.86		~~M Run~~ Bankfull pt.
12	1+63	(+1.60)		8.71		8.24		6.99		6.99		M Run
13	TP1	3.55	103.55					/				T Pool
14	1+86.5			7.35		6.50		5.60		5.60		T Pool
15	2+02			9.06		6.53		5.46		~~5.47~~		M Pool Pool max 9.06
16	2+13			8.47		6.44		/		5.54		T G
17	2+19			8.12		6.45		/		5.76		m G
18	2+23			7.01		6.70		/		5.30		T R
19	2+56			7.69		7.11		/		5.04		m R
20	2+63			7.89		7.32		/		4.99		T N
21	2+67			8.11		7.34		/		4.99		m N
22	2+74			8.60		7.37		/		4.85		T P
23	2+82			9.48		7.36		6.29		5.84		m P Pool max 9.48
24												
25												
26						Check		BM1		5.25 ✓		
27								BM2		3.55 ✓		(TP1)

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DECLIN. 10.5° W

19.5 W / BKFL

19.5 x 20

390 – 546

SURVEY DATA ⟶ **LONGITUDINAL PROFILE 2**

SITE: SWEET RUN TEAM 3 Date: 3/22/16

Location: REACH 3

Party / Notes: DAWN, STEVE, MIKE HUC:

	Distance, Point, or STATION (ft)	Back-Sight BS (ft)	Height of Instrument HI (ft)	Thalweg Fore-Sight FS (ft)	Thalweg Elevation Elev. (ft)	Water Surface Fore-Sight FS (ft)	Water Surface Elevation Elev. (ft)	Bankfull Fore-Sight FS (ft)	Bankfull Elevation Elev. (ft)	Low Bank HI Fore-Sight FS (ft)	Low Bank HI Elevation Elev. (ft)	NOTES e.g. Riffle Run Pool Glide
28	BM	3.55	103.55									TR
29	3+81.2			8.70		8.08		7.01		5.76		LLB LEW
30	3+73.4			8.76		8.09		7.41		5.79		LLB, LEW
31	3+57			8.98		8.11				5.43		TG, LLB
32	3+26			9.95		8.09				5.53		DP, LLB
33	3+25			9.20		8.[illegible]				5.85		TP.
34	3+19			8.40		7.99				5.45		BK; TN; LLB;
35	3+08.4			8.24		7.43				4.08		REW; LLB; TR
36	2+95.3			8.05		7.39				4.35		TG; LLB
37	BM	3.55										
38												
39												
40												
41												
42												
43												
44												
45												
46												
47												
48												
49												
50												
51												
52												
53												
54												

5.76 LB
5.23

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ROSGEN REPRESENTATIVE REACH PEBBLE COUNT

STREAM: Sweet Run | **DATE:** 5/23/16

REACH: Team 3 | **CREW:** Mike, Dawn, John

PARTICLE TALLY COUNTS BY TRANSECT

ft	PARTICLE	mm		36 1	144 2	164 3	197 4	258 5	276 6	321 7	323 8	358 9	366 10	Tot Pool	Tot Riff	Comb Tot	%CUM
	Silt/Clay	< .062	S/C		1		2							3	0	3	
	Very Fine	.062 - .125	S											0	0	0	
	Fine	.125 - .25	A		1				1			3		2	3	5	
	Medium	.25 - .50	N		1	1	6	1	1	1	3	3		7	8	17	
	Coarse	.50 - 1.0	D	2					1	1		1		1	4	5	
	Vry Coarse	1.0 - 2	S	2					1	1				1	3	4	
	Very Fine	2 - 4									1			0	1	1	
	Fine	4 - 6	G								1			0	1	1	
	Fine	6 - 8	R										1	0	1	1	
	Medium	8 - 12	A		2		1			1		1	3	3	5	8	
	Medium	12 - 16	V		1	1		2	1					4	1	5	
	Coarse	16 - 24	E	2		1		2					1	2	4	6	
	Coarse	24 - 32	L	2		3		3					2	3	7	10	
	Vry Coarse	32 - 48	S	1	1	2		1		4	2			8	3	11	
	Vry Coarse	48 - 64		1	2	1	1						1	3	3	6	
0.21-0.31	Small	64 - 96	C		1			1	2		2		1	4	3	7	
0.31-0.42	Small	96 - 128	O						1					1	0	1	
0.42-0.63	Large	128 - 192	B			1			2			1		2	2	4	
0.63-0.84	Large	192 - 256	L							1	1		1	0	3	3	
0.84-1.26	Small	256 - 384	B							1		1		0	2	2	
1.26-1.68	Small	384 - 512	L											0	0	0	
1.68-3.36	Medium	512 - 1024	D											0	0	0	
3.36-6.72	Lrg	1024 - 2048	R											0	0	0	
6.72-13.43	Vry Lrg	2048-4096												0	0	0	
	Bedrock	>4096	BDRK											0	0	0	
	FEATURE SAMPLED			R	P	R	P	P	P	R	R	R	R				

	Length	Proportion	No. Units	Sampled
REACH				
POOL				
RIFFLE				
RUN				

321 undercut bank

Transect	Feature	Length	Width
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

RIFFLE PEBBLE COUNT AND LARGEST PARTICLE ON BAR COUNT

STREAM: Sweet Run | **DATE:** 23-Mar-16

REACH: 3 | **CREW:** Team 3 - SH, KS, WW

XS No.: | **Riffle Location (also mark on reach sketch):**

~~Reach 258~~ 250 323 **Particle Count** 358

ft	PARTICLE	mm		1	2	~~Run~~	4 Run	5	6	7	8	9	10	TOTALS Tot #	TOTALS % Cum
	Silt/Clay	< .062	S/C		Total										
	Very Fine	.062 - .125	S		Ø										
	Fine	.125 - .25	A		1				IIII						
	Medium	.25 - .50	N		1		1	IIII	IIII						
	Coarse	.50 - 1.0	D	IIII	3				I						
	Vry Coarse	1.0 - 2	S	II	2										
	Very Fine	2 - 4		I	1			I							
	Fine	4 - 6	G	IIII	5			I							
	Fine	6 - 8	R	II	2										
	Medium	8 - 12	A	IIII IIII	10				I						
	Medium	12 - 16	V	IIII IIII	9		II								
	Coarse	16 - 24	E	IIII IIII IIII	15		II								
	Coarse	24 - 32	L	IIII IIII	8		IIII								
	Vry Coarse	32 - 48	S	IIII I	6		I	II							
	Vry Coarse	48 - 64		IIII II	7										
0.21-0.31	Small	64 - 96	C	IIII IIII IIII IIII	21		I	II							
0.31-0.42	Small	96 - 128	O	IIII	5										
0.42-0.63	Large	128 - 192	B	II	2				I						
0.63-0.84	Large	192 - 256	L	II	2			I							
0.84-1.26	Small	256 - 384	B		Ø				I						
1.26-1.68	Small	384 - 512	L		Ø										
1.68-3.36	Medium	512 - 1024	D		Ø										
3.36-6.72	Lrg	1024 - 2048	R		Ø										
6.72-13.43	Vry Lrg	2048-4096			Ø										
	Bedrock	>4096	BDRK		Ø										

LARGEST PARTICLES ON BAR

Bar Location (also mark on reach sketch):

Bar Length:
Bar Width (Thalweg - BF):
Sketch bar profile (Thalweg - BF)

Part. #	mm	Part. #	mm	Part. #	mm
1		6		11	
2		7		12	
3		8		13	
4		9		14	
5		10		15	

Worksheet 26. Bar sample form

Point / Side BAR-BULK MATERIALS SAMPLE DATA: Size Distribution Analysis

Party: Group 3: Dawn, Whitney, Keith, John, Steve, Mike

Location: Sweet Run

Date: 3/23/16

Notes:

SUB SAMPLES	Sieve SIZE 2mm		Sieve SIZE 4mm		Sieve SIZE 8mm		Sieve SIZE 16mm		Sieve SIZE 32mm		Sieve SIZE 64mm		Sieve SIZE 132		Sieve SIZE <2mm		Sieve SIZE	
	Tare Weight 850g		Tare Weight 840g		Tare Weight 840g		Tare Weight 840g		Tare Weight 840		Tare Weight 840		Tare Weight 840g		Tare Weight [illegible]g		Tare Weight	
	Sample Weights		Sample Weights		Sample Weights		Sample Weights		Sample Weights		Sample Weights		Sample Weights		Sample Weights		Sample Weights	
	Total	Net	Total	Net	Total	Net	Total	Net	Total	Net	Total	Net	Total	Net	Total	Net	Total	Net
1	~~29oz~~	~~822g~~	~~25oz~~	~~708~~	~~30oz~~	~~850~~	~~32oz~~	~~907~~	Ø oz	0	Ø oz	0	50oz	1417	157oz	4309		
2	1672	822	1549	708	850	10	907	668					1417	567	4308	3308		
3																		
4	~~48oz~~	~~1360~~	61oz	1729	~~80oz~~	~~2267~~	~~92oz~~	~~2608~~	110oz	3118	30oz	878	Ø	0	99oz	2806		
5	1360	510	1729		2267		2608		3118		878				2806			
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
Net Wt. Total																		
% Grand Tot.																		
Accum. % =<																		

SURFACE MATERIALS DATA (Two Largest Particles)

No.	Dia.	WT.
1	2.5 in	12 oz
2	2.5 in	6 oz

Bucket + Materials Weight_____

Bucket Tare Weight_____

Materials Weight_____

(Materials less than: _____mm.)

Be Sure to Add Separate Material Weights to Grand Total

GRAND TOTAL SAMPLE WEIGHT

NOTES

1 oz = 28.34 grams

Riffle #1

Run 3
WW SH
DM

Riffle Stability Index

Material	Size Range (mm)		Pebble Counts	% in Class	Cumulative		
silt/clay	0	0.062			0	2	
very fine sand	0.062	0.13			0	0	
fine sand	0.13	0.25	|||		3	23	
medium sand	0.25	0.5	||||		4	13	
coarse sand	0.5	1	卌 卌		10	17	
very coarse sand	1	2	|		1	1	56
very fine gravel	2	4	|		1	2	
fine gravel	4	6	|		1	2	
fine gravel	6	8	||		2	5	9
medium gravel	8	11	||||		4	10	
medium gravel	11	16	卌 卌		10	21	31
coarse gravel	16	22	卌 ||||		9	13	
coarse gravel	22	32	卌 |||		9	16	29
very coarse gravel	32	45	卌 卌 ||		12	21	
very coarse gravel	45	64	卌 卌 |		11	24	45
small cobble	64	90	卌 |||		8	15	
medium cobble	90	128	卌 |||		8	14	29
large cobble	128	180	|||		3	7	
very large cobble	180	256	卌		5	5	12
small boulder	256	362	|		1	1	
small boulder	362	512			0	0	1
medium boulder	512	1024			0	0	
large boulder	1024	2048			0	0	0
very large boulder	2048	4096			0	0	0

Total Particles =

Enter intermediate diameters (mm) of 10 – 30 particles on bar:

1		11		21	
2		12		22	
3		13		23	
4		14		24	
5		15		25	
6		16		26	
7		17		27	
8		18		28	
9		19		29	
10		20		30	

Geometric Mean Grain Size (mm) =

Riffle #1

Riffle Stability Index

Material	Size Range (mm)		Pebble Counts		% in Class	Cumulative
silt/clay	0	0.062	II	2		
very fine sand	0.062	0.13		0		
fine sand	0.13	0.25	~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~	20.		
medium sand	0.25	0.5	~~IIII~~ IIII	9		
coarse sand	0.5	1	~~IIII~~ II	7		
very coarse sand	1	2		0		
very fine gravel	2	4	I	1		
fine gravel	4	6	I	1		
fine gravel	6	8	III	3		
medium gravel	8	11	~~IIII~~ I	6		
medium gravel	11	16	~~IIII~~ ~~IIII~~ I	11		
coarse gravel	16	22	IIII	4		
coarse gravel	22	32	~~IIII~~ II	7		
very coarse gravel	32	45	~~IIII~~ IIII	9		
very coarse gravel	45	64	~~IIII~~ ~~IIII~~ III	13		
small cobble	64	90	~~IIII~~ II	7		
medium cobble	90	128	~~IIII~~ I	6		
large cobble	128	180	IIII	4		
very large cobble	180	256		0		
small boulder	256	362		0		
small boulder	362	512		0		
medium boulder	512	1024		0		
large boulder	1024	2048		0		
very large boulder	2048	4096		0		
Total Particles =				110		

Enter intermediate diameters (mm) of 10 – 30 particles on bar:

1	125	11	98	21	94
2	102	12	200	22	180
3	128	13	150	23	158
4	130	14	128	24	131
5	118	15	100	25	156
6	100	16	148	26	105
7	125	17	98	27	98
8	116	18	146	28	142
9	118	19	100	29	150
10	135	20	135	30	175

Geometric Mean Grain Size (mm) = GEOMEAN = 127

n = 30

Field Data Sheet for Discharge Measurements

Stream Discharge Measurement Sheet

Site ID #: End of Run
Name and Location: Sweet Run
Date: _____ Crew: Team 3

County: Loudon
Weather: clear/calm $t_{air} \cong 65°F$
Cross-section Location: End-of-Run Riffle - just down from EOR)
Meter: Marsh McBirney

	Station	Width	Depth	Area (Width x Depth)	Run Length	Secs	Velocity (fs)	Average Velocity Use with 2pt method (0.2+0.8)/2	Discharge (Area x Velocity) (cfs)
#1 EW	1.0	1.0	0				0		
	2.0		0.5	0.5			0.64		0.32
	3.0		0.5	0.5			0.89		0.45
	4.0		0.9	0.9			0.5		0.36
	5.0		0.8	0.8			0.34		0.27
	6.0		0.7	0.7			0.70		0.49
	7.0		0.5	0.5			0.4		0.2
	8.0		0.4	0.4			0.6		0.24
	9.0		0.4	0.4			0.36		0.144
	10.0		0.15	0.15			0		Ø
EW	11.5	1.5	0	Ø			0		Ø 2.5 cfs
EW	11.5		Ø				Ø		Ø
#2	10.0	1.5	0.25	0.375			Ø		Ø
	9.0	1.0	0.3	0.3			0.2		0.6
	8.0	1.0	0.4	0.4			0.68		0.272
	7.0	1.0	0.5	0.5			0.62		0.31
	6.0	1.0	0.7	0.7			0.67		0.469
	5.0	1.0	0.9	0.9			0.44		0.396
	4.0		0.8	0.8			0.43		0.344
	3.0		0.4	0.4			0.74		0.296
	2.0		0.35	0.35			0.88		0.308
	1.0	0.9	0.1	Ø			Ø		2.995
REW 1.0									~3.0 cfs

Total Discharge: _____ CFS (oMeasured, o Estimated)

Comments:

Avg = 2.75 cfs

Field Data Sheet for Discharge Measurements

Stream Discharge Measurement Sheet

Site ID #: SWEET RUN
Name and Location: US UPSTREAM - Reach 3
Date: 3/24/2016 Crew: #2

County:
Weather: SUNNY WARM
Cross-section Location:
Meter:

Station	Width	Depth	Area (Width x Depth)	Run Length	Secs	Velocity (fs)	Average Velocity Use with 2pt method (0.2+0.8)/2	Discharge (Area x Velocity) (cfs)
2	.5	.25	0.125			.60		0.075
2.5	.5	.51	0.255			.66		0.1683
3	.5	.65	0.325			.66		0.2145
3.5	.5	.85	0.425			.7		0.2975
4.0	.5	.94	0.47			.67		0.3149
4.5	.5	1.1	0.55			.7		0.385
5	.5	1.2	0.60			.69		0.414
5.5	.5	.95	0.475			.58		0.2755
6.0	.5	.90	0.45			.39		0.1755
6.5	.5	.85	0.425			.14		0.0595
7.0	.5	.85	0.425			.07		0.02975
7.5	.5	.80	0.4			.01		0.004
8.0	.5	.70	0.35			.00		0.000
8.5	.5	.40	0.20					0.000
9.0	.5	.36	0.18					
9.5	.5	.30	0.15					
10.0	.5	.25	0.125					
10.5	.5	.26	0.13			.00		
11.0	.5	.16	0.08			.00		0.00
9'								

Total Discharge: 2.413 CFS (oMeasured, o Estimated)

Comments:

Field Data Sheet for Discharge Measurements

Stream Discharge Measurement Sheet

Site ID #: _____

Name and Location: Sweet Run

Date: 3/24/16 Crew: Steven, John, Kreth

County: London

Weather: Sunny

Cross-section Location: Run

Meter: _____

Station	Width	Depth	Area (Width x Depth)	Run Length	Secs	Velocity (fs)	Average Velocity Use with 2pt method (0.2+0.8)/2	Discharge (Area x Velocity) (cfs)
1.6	1.6	0.1	0.16			Ø		0
2.6	1	0.55	0.55			0.72		0.396
3.6	1	0.9	0.9			0.73		0.657
4.6	1	1.0	1.0			0.74		0.74
5.6	1	1.0	1.0			0.57		0.57
6.6	1	0.85	0.85			0.12		0.102
~~7.6~~	~~1~~	~~0.8~~	~~0.8~~					
~~8.6~~	~~1~~	~~0.0~~						
9.6	3	0.4	1.2			0		0
10.6	1	0.3	0.3			0		0
11.6	1	0.1	0.1			0		0

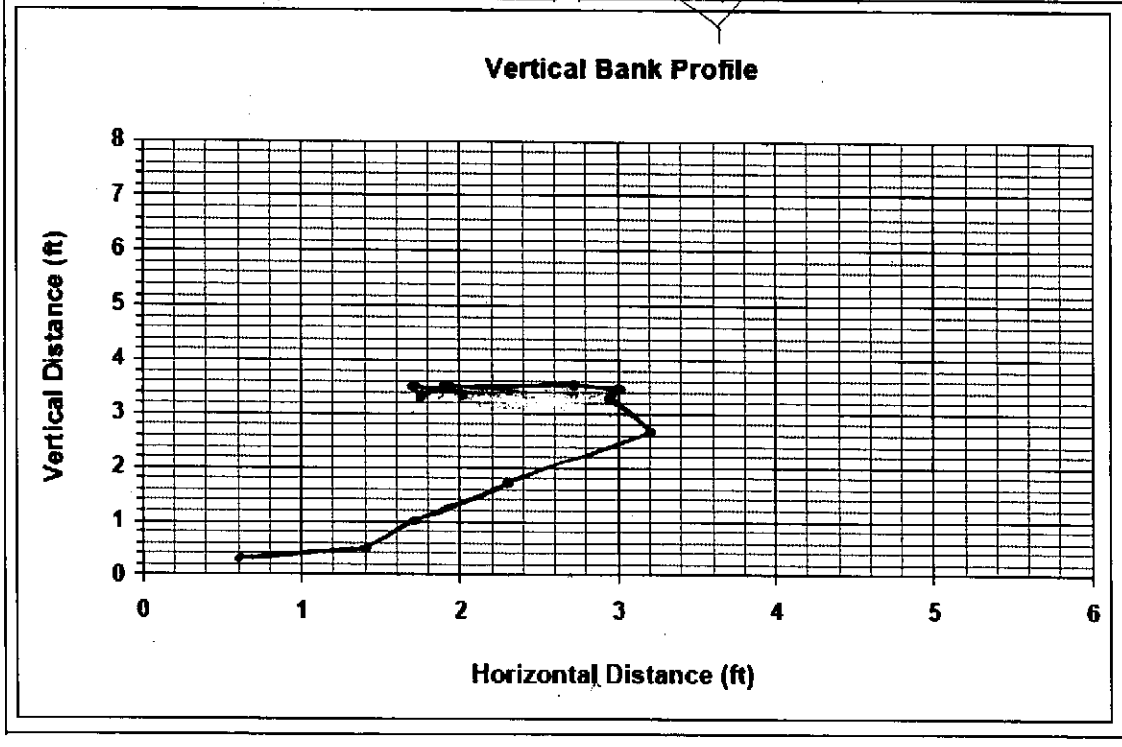
Total Discharge: 2.47 CFS (oMeasured, o Estimated)

Comments:

Worksheet 6-2. Bank profile and bank erosion summary data form.

Stream: Sweet Run	Observers: Team #3
Location: Reach 3	Date: 24-Mar-16
Cross-section:	BEHI adjective:
Bank:	NBS adjective:
Toe pin station (ft):	Predicted erosion (ft):
Toe pin elevation (ft):	Measured erosion (ft):

Date: Thurs.			Date:		
0.21	0.48	From fake toe pin	0.59	0.36	Below water surface
0.92	0.68		1.4	0.56	
1.28	0.92		1.69	1.05	
1.73	1.29		2.32	1.76	
2.03	1.57		3.20	2.69	
2.52	1.79		2.94	3.35	
3.0	2.5		3.0	3.41	
3.50	2.85		2.7	3.56	
3.76	3.22		1.9	3.53	
3.84	3.59		1.7	3.40	
3.65	3.90	Bank starts to curl out	1.71	3.52	
3.63	4.14				
3.90	4.39				
5.26	4.86	Top of bank			



Large Woody Debris Measurement

Three types of LWD: logs, rootwads, and jams:

Log criteria: dead, 5 cm minimum diameter at some point, 2 meters minimum length, 5 cm minimum within bankfull channel
Rootwads: dead root system fully detached from original position, 20 cm minimum diameter, less than 2 meters length, 5 cm minimum within bankfull channel
Jams: accumulation of 3 or more qualifying logs physically touching at one or more points, 5 cm minimum of jam within bankfull channel; (data- count number of jams and number of logs within a jam)

Length:
Logs: from end to end, include root system if present
Rootwads: from end to end

Diameter:
Logs: measure diameter to nearest cm at the log midpoint (if branches at midpoint of length, measure diameter just below)
Rootwads: measure diameter to nearest cm at the point where the trunk (bole) meets the roots

Conduct a count of all large woody debris, root wads, and jams (number and # logs per jam) within the reach that meet dimensions described above. Count all pieces of wood lying within the reach that has any portion within the bankfull width and depth of the channel. Assign to class categories.

Size classes of large woody debris (logs and rootwad)

	Diameter (cm)			
Length (meters)	5 – 10	11 – 50	>50	Rootwad
2 – 5	Class 1	Class 2	Class 3	Class 7
> 5	Class 4	Class 5	Class 6	

Data (counts)

Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Rootwad	Jam*
~~IIII~~ ~~IIII~~ II	~~IIII~~ I	I	IIII	~~IIII~~ I	I	III	Jam 1/3 1/4

*Count the number of jams and the number of logs per jam (count rootwads as rootwads, even if associated)
Example: Jam1/4 logs, Jam2/3 logs, etc.

Examples:
Basinwide Visual Estimation Technique
Method Manual for Large Woody Debris Survey (http://access.nwifc.org/tfw/documents/TFW_Large_Woody_Debris.pdf

Stream _____ Location: _____ Team: _____

Systematic transects spaced at 2 mean stream widths intervals. *Velocity*, *Depth*, *Substrate*, and *Embeddedness* measurements taken at points 0.25, 0.5, and 0.75 wetted stream width of transect. Four substrate measurements taken at each observation point. Measurements taken from left descending bank to right descending bank

Silt (<0.062) = 1, Sand (0.062 - 2 mm) = 2, Gravel (fine; 2 – 16 mm) = 3, Gravel (coarse or "Pebble"; 17 – 63 mm) = 4, Cobble (64 – 256 mm) = 5, Boulder (256 – 4,096 mm) = 6, Bedrock (> 4,096 mm)

Embeddedness: **1** = <5%, **2** = 5 – 25%, **3** = 26 – 50%, **4** = 51 – 75%, **5** > 75%

Canopy presence/absence: taken with tube densiometer at 10 evenly spaced points per transect; P = 1.

Strip transect: *Instream cover* (2 foot intervals); >10 cm = 2 surfaces, <10 cm = 1 surface, <3 cm apart = 1 surface, > 3 cm apart = 2 surfaces; *Structural complexity* (6 foot intervals)

At each end of transect: *Bank angle* (taken with clinometer), *Riparian cover* density (taken with spherical densiometer)

Distance (feet)	Wetted Width	Velocity (ft/sec)	Depth (inches)	Substrate mm	Embedded	Bank angle L	Bank angle R	Instr Cover	Mesohabitat Type	Rip density L	Rip density R	Canopy P/A
7.3	23.3	0	6.1	45 130 18 11	2, 5 3, 3	30°	UNDER CUT 42°	~~IIII~~ (5)	RIFFLE	15	16	~~P~~ ~~IIII~~ ~~IIII~~ 10 A-
13.3		0	0	27 74 28 90	1, 5 2, 5							
19.3		0.60	0.2	CS(2) 21 CS(2) 21	1, 1 2 1							

3/24

Stream SWEET RUN Location: Reach #3 Team: 3

1) Extend both ends of the systematic transects for instream habitat to bankful locations. Where transect intercepts bankful location, center a 1 x 5 m quadrat perpendicular to the transect, with the bankful line marking the center of the streamside quadrat boundary. Make hardwood stem density counts just above ground level within each 1 x 5 m quadrat.
2) Extend both ends of the systematic transects for instream habitat 5 m into the riparian zone. Use a cruise prism to estimate area of board feet per acre via "point sampling". Multiply "in trees" by 10 to estimate basal area per acre in square feet.*

Distance (feet)	L or R Bank	Stem (woody) Density (#)	Point Sample # of "In" Trees	Basal Area (ft^2/acre)	L or R Bank	Stem (woody) Density (#)	Point Sample # of "In" Trees	Basal Area (ft^2/acre)
7.3	R	13	13	130	L	1	43	430 ft²/ac

The prism is held a comfortable distance away from the eye with the bottom edge parallel to the ground, and trees are sighted through the prism approximately 4.5 ft. above the ground. A tree is an "in" tree if the offset section of the tree overlaps the bole. A tree where the offset section of the trunk is perfectly aligned with the original bole is a borderline tree and commonly in practice, every other borderline tree is counted. A tree where the offset section of the tree does not overlap or touch the original bole is an "out" tree and is not counted. Basal area is estimated by multiplying the count of "in" trees at a given point by the 'factor' of the prism.

36.6 25 50 75 D95 = 260

Stream SWEET RUN Location: Team: 3

18.3

Systematic transects spaced at 2 mean stream widths intervals. *Velocity*, *Depth*, *Substrate*, and *Embeddedness* measurements taken at points 0.25, 0.5, and 0.75 wetted stream width of transect. Four substrate measurements taken at each observation point. Measurements taken from left descending bank to right descending bank

Silt (<0.062) = 1, Sand (0.062 - 2 mm) = 2, Gravel (fine; 2 – 16 mm) = 3, Gravel (coarse or "Pebble"; 17 – 63 mm) = 4, Cobble (64 – 256 mm) = 5, Boulder (256 – 4,096 mm) = 6, Bedrock (> 4,096 mm)

Embeddedness: **1** = <5%, **2** = 5 – 25%, **3** = 26 – 50%, **4** = 51 – 75%, **5** > 75%

Canopy presence/absence: taken with tube densiometer at 10 evenly spaced points per transect; P = 1.

Strip transect: *Instream cover* (2 foot intervals); >10 cm = 2 surfaces, <10 cm = 1 surface, <3 cm apart = 1 surface, > 3 cm apart = 2 surfaces; *Structural complexity* (6 foot intervals)

At each end of transect: *Bank angle* (taken with clinometer), *Riparian cover* density (taken with spherical densiometer)

Distance (feet)	Wetted Width	Velocity (ft/sec)	Depth (inches)	Substrate	Embedded	Bank angle L	Bank angle R	Instr Cover	Mesohabitat Type	Rip density L	Rip density R	Canopy P/A
LONG 17												
53	19	6'-REW=0.95 9'-REW=1.12 14'-REW=0.82	0.30 0.35 0.30	2,5,2,5 5,5,3,4 3,5,3,4	3 2 3	20	10	5	Riffle	17 = Presence R. bank 17 = Present L. Bank		P17/R bank A = P17/L bank P = ~~IIII~~ ~~IIII~~

Stream _____ Location: _____ Team: _____

1) Extend both ends of the systematic transects for instream habitat to bankful locations. Where transect intercepts bankful location, center a 1 x 5 m quadrat perpendicular to the transect, with the bankful line marking the center of the streamside quadrat boundary. Make hardwood stem density counts just above ground level within each 1 x 5 m quadrat.
2) Extend both ends of the systematic transects for instream habitat 5 m into the riparian zone. Use a cruise prism to estimate area of board feet per acre via "point sampling". Multiply "in trees" by 10 to estimate basal area per acre in square feet.*

12

240
130
130

Distance (feet)	L or R Bank	Stem Density (#)	Point Sample # of "In" Trees	Basal Area (ft^2/acre)	L or R Bank	Stem Density (#)	Point Sample # of "In" Trees	Basal Area (ft^2/acre)
	R	29	130					

The prism is held a comfortable distance away from the eye with the bottom edge parallel to the ground, and trees are sighted through the prism approximately 4.5 ft. above the ground. A tree is an "in" tree if the offset section of the tree overlaps the bole. A tree where the offset section of the trunk is perfectly aligned with the original bole is a borderline tree and commonly in practice, every other borderline tree is counted. A tree where the offset section of the tree does not overlap or touch the original bole is an "out" tree and is not counted. Basal area is estimated by multiplying the count of "in" trees at a given point by the 'factor' of the prism.

Worksheet A-1. Field Form for Level II Stream Classification.

Stream: Sweet Run	
Basin: Piney Run - Potomac Drainage Area: 1,66 acres 1267 mi^2	
Location: Loudon County, Virginia	
Twp.&Rge:	Sec.&Qtr.:
Cross-Section Monuments (Lat./Long.): Site: 39.2835	Date: 3/22
Observers: Team #3	Valley Type:

Bankfull WIDTH (W_{bkf}) WIDTH of the stream channel at bankfull stage elevation, in a riffle section.	23.9	ft
Bankfull DEPTH (d_{bkf}) Mean DEPTH of the stream channel cross-section, at bankfull stage elevation, in a riffle section ($d_{bkf} = A_{bkf} / W_{bkf}$).	0.93	ft
Bankfull X-Section AREA (A_{bkf}) AREA of the stream channel cross-section, at bankfull stage elevation, in a riffle section.	22.3	ft^2
Width/Depth Ratio (W_{bkf} / d_{bkf}) Bankfull WIDTH divided by bankfull mean DEPTH, in a riffle section.	25.7	ft/ft
Maximum DEPTH (d_{max}) Maximum depth of the bankfull channel cross-section, or distance between the bankfull stage and Thalweg elevations, in a riffle section.	1.3	ft
WIDTH of Flood-Prone Area (W_{fpa}) Twice maximum DEPTH, or ($2 \times d_{mbkf}$) = the stage/elevation at which flood-prone area WIDTH is determined in a riffle section.	28.1	ft
Entrenchment Ratio (ER) The ratio of flood-prone area WIDTH divided by bankfull channel WIDTH (W_{fpa} / W_{bkf}) (riffle section).	1.2	ft/ft
Channel Materials (Particle Size Index) D_{50} The D_{50} particle size index represents the median or dominant diameter of channel materials, as sampled proportionately from the channel surface, between the bankfull stage and Thalweg elevations. (riffle)	17	mm
Water Surface SLOPE (S) Channel slope = "rise over run" for a reach approximately 20–30 bankfull channel widths in length, with the "riffle-to-riffle" water surface slope representing the gradient at bankfull stage.	0.0076 0.76	ft/ft ft/ft %
Channel SINUOSITY (k) Sinuosity is an index of channel pattern, determined from a ratio of stream length divided by valley length (SL / VL); or estimated from a ratio of valley slope divided by channel slope (S_{val} / S).	1.4	

Stream Type F4 **See Classification Key (Figure A-2)**

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