12-4-2009

Ex. 281-US-422

Mike Gagner
R2 Resource Consultants

May 15, 2004

Sampling

1442.01

WD-3

"Rite in the Rain"®

ALL-WEATHER

LEVEL BOOK

No. 310

CONTENTS

PAGE	REFERENCE	DATE

WB-3 Crooked Cr.

05/15/04

	In	Out
Time	9:00	1:00
S.G	1.69	1.69

Crew: M. Wagner
A. Weybright

Equipment: sampler: 3602 prop. 1B
cal. 0130

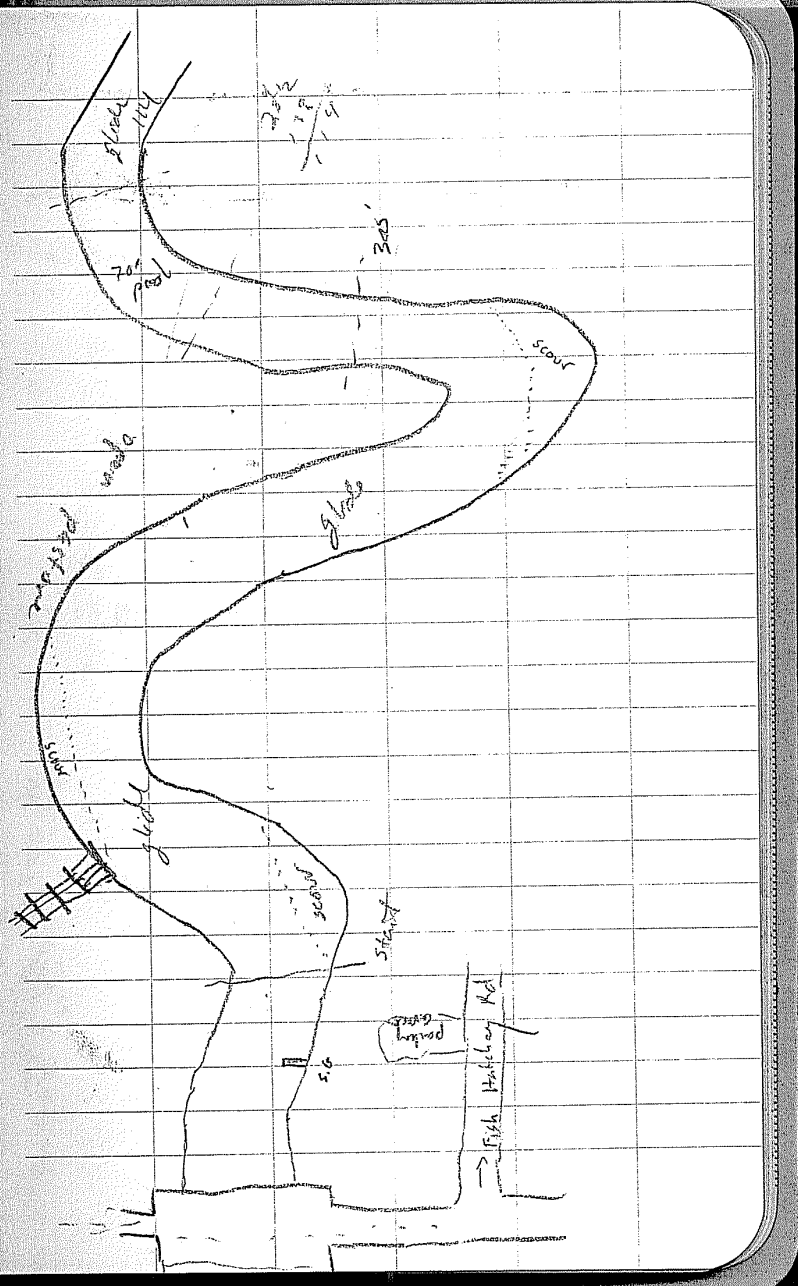
Directions: From K-Falls head north on Hwy 97 toward Chiloquin. After ~20 miles you will cross over the Williamson R. ~1/4 mile after crossing Williamson look for left hand turn onto Hwy 62 and follow for ~7 3/4 miles to Wood R. crossing. Turn right on Fish Hatchery Rd just before crossing Wood R. Park at turn out on U/S side of bridge. First transect is located 100' U/S of bridge crossing.

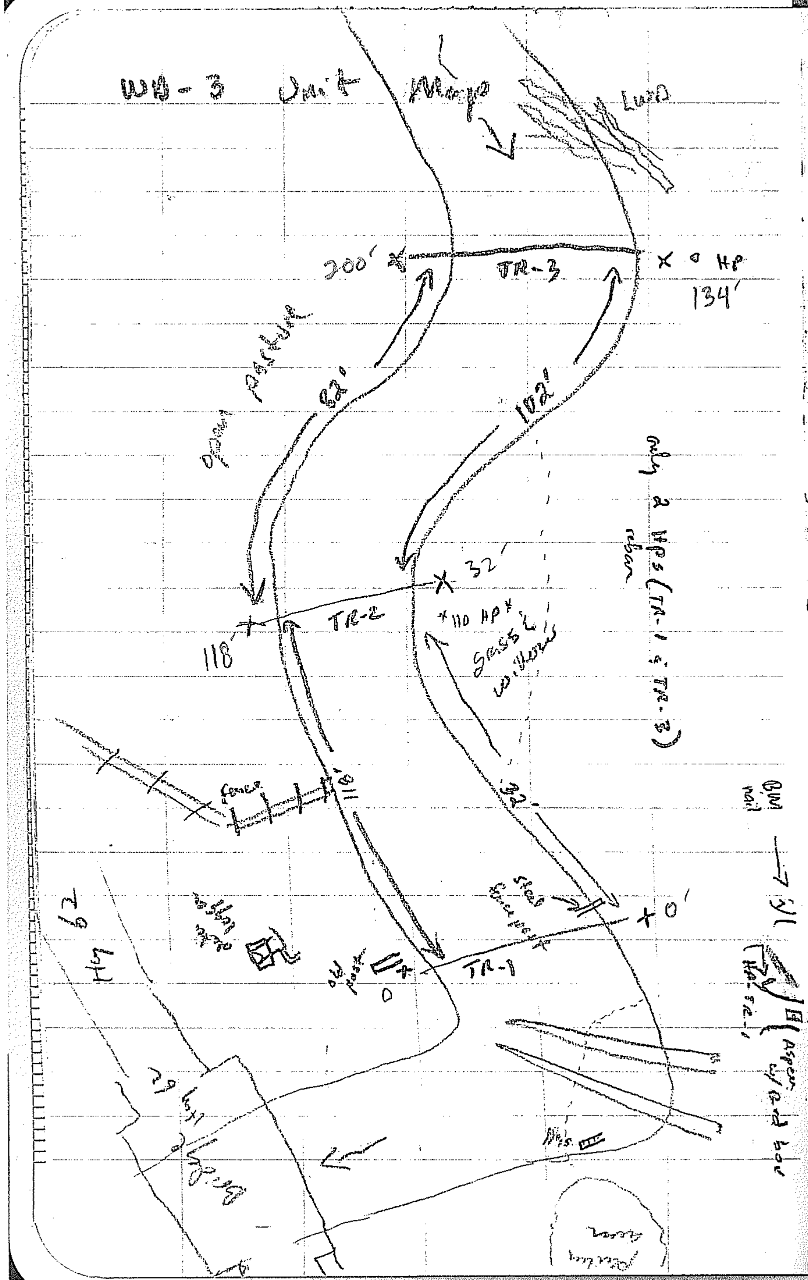
WD-3

Crooked Cr. Habitat Survey 05/15/04

Unit #	Type	Length x width	Notes

* stream gradient is very flat (<.5% slope) the habitat is glide with poorly defined scour holes along outside edge of meander bends
* hand placed transects to capture small amount of veribility





WD-3 Photo Log

Photo #	Description
#21	Looking u/s from start
20	" u/s from 300 u/s of start
19	" u/s from 450 " " "
18	Looking L→R across TR-1
17	" R→L " TR-1
16	" L→R " TR-2
15	" R→L " TR-2
14 (Marked on board as TR-2)	L→R TR-3
13	L→R TR-3
12	R→L TR-3
11	Looking u/s from TR-3

WD-3 Level loop Crooked C. 05/15/04

STA	BS	HI	FS	Elevn
BM	2.91			100.00
		102.91		
TR-1 HP			3.10	99.81
TR-3 HP			3.45	99.46
Top Wood stake (TP)				
Top Wood stake (TP)				
TR-3 HP	3.49			99.46
		102.95		
TR-1 HP			3.14	99.81
BM			2.95	100.00

WD-3 WSEs 05/15/04

STA	BS	HI	FS	Elevn	Rod.
		102.95			
TR-3 LWS			6.05	96.90	
RWS			6.06	96.89	
TR-2					
LWS			6.07	96.88	
RWS			6.08	96.87	
(TP)					
TR-1 HP	2.92			99.81	
		102.73			
TR-1					
LWS			5.87	96.86	
RWS			5.87	96.86	
N 100' d/s of TR-1			~~13.17~~ 9.90 bed elevation		~~bad (3.80)~~ 3.70

* the stream is very flat & homogeneous *

WB-3 TR-1 D&V 05/15/04

STA	Depth	Vel.	Notes
RWP = 1.0			
14.0	0.0	0.0	Ap. veg RWE
15.0	2.70	.10 .38	" "
16.0	2.90	.63 .68	
17.0	3.05	.82 .61	
18.0	3.15	.70 .85	
19.0	3.00	.72 .79	
20.0	2.95	.72 .83	
21.0	2.95	.72 .67	
22	2.90	.69 .70	
23	2.75	.68 .76	
24	2.65	.79 .73	
25	2.45	.76	
26.5	2.10	.78	
28.0	1.95	.77	
29.5	1.90	.70	
31.0	1.75	.62	
32.5	1.60	.65	
34.0	1.45	.61	
35.5	1.35	.56	
37.0	1.40	.46	
38.5	1.55	.30	

WB-3 TR-1 D&V Contin.

STA	Depth	Vel.	Notes
40.0	1.7	.60	
41.5	1.35	.05 est.	
LWE 42.0	0.0	0.0	
LWP = 61.1			

* Swoffer Unit 3602 (1B)
changed propeller from 2' to 3' unit
adjusted unit calibration to 0130

WD-3 TR-2 D & V 05/15/04

STA	Depth	Vel.	Notes
RWP=1.0			
RWE=19.2	0.0	0.0	veg
19.7	0.35	0.0	veg
20.1	out .10		humic
20.6	0.0	0.0	veg
21.0	.60	0.0	veg
22.5	.80	.17	
24.0	1.1	.40	± 1'-.2-.4' of muck/organics on bottom
25.5	1.35	.44	"
27.0	1.25	.41	"
28.5	1.20	.48	"
30.0	1.20	.54	1-.2' muck
31.5	1.30	.59	"
33.0	1.45	.63	"
34.5	1.55	.58	
36.0	1.80	.60	
37.5	2.0	.65	
39.0	2.3	.73	
40.5	2.55	.75 .69	
42.0	2.75	0.76 0.65	
43.5	2.85	.76 .68	
45.0	3.10	.80 .71	

WD-3 TR-2 continued 05/19/04

STA	Depth	Vel.	Notes
46.5	3.25	.83 .75	
48.0	3.25	.83 .75	
49.0	3.15	.18 .79	veg/edge vel. break
50.0	2.85	~.05 est .69	"
51.0	2.90	~.05 est .09	"
51.7 52.0	2.90	0.0	"
52.0	1.20	0.0	"
53.0	.60	0.0	
LWE=53.8	0.0		
LWP=64.3			

WD-3 TR-3 Glide D&V

STA	Depth	Vel.	Notes
RWP = 1.0'			
RWE = 12.0			
14.0	0.05	0.0	
15.0	0.1	0.0	
16.0	0.3	0.0	
17.0	0.5	0.0	
18.0	1.0	0.05	
19.0	1.05	0.34	
20.0	1.00	0.56	
21.5	1.20	0.76	
23.0	1.45	0.90	
24.5	1.75	0.91	
26.0	2.2	0.77	
27.5	2.5	0.65/0.92	
29.0	2.65	0.83/0.65	
30.5	3.10	0.80/0.40	
32.0	3.55	0.71/0.48	Piece of LWD on bottom
33.5	3.70	0.63/0.10	" LWD on bottom; deepest part of TR
35.0	3.60	0.66/0.16	LWD on bottom
36.5	3.30	0.58/0.19	
38.0	3.20	0.61/0.24	
39.0	2.80	0.61/0.25	
41.0	2.35	0.45	
42.5	2.20	0.54	
44.0	1.75	0.32	LWP = 49.5
45.5	1.30	0.28	LWE = 46.7

undercut 0.60'
D = 0.7 V = 0.11

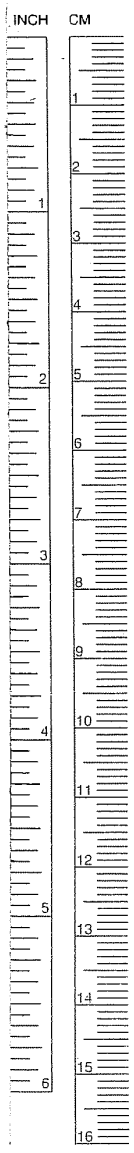
WD-3

WD-3

"Rite in the Rain"®
ALL-WEATHER
LEVEL BOOK
No. 310

June 27, 2004

Survey



MEASUREMENT CONVERSIONS

IF YOU KNOW	MULTIPLY BY	TO FIND
LENGTH		
inches	2.540	centimeters
feet	30.480	centimeters
yards	0.914	meters
miles	1.609	kilometers
millimeters	0.039	inches
centimeters	0.393	inches
meters	3.280	feet
meters	1.093	yards
kilometers	0.621	miles
WEIGHT		
ounces	28.350	grams
pounds	0.453	kilograms
grams	0.035	ounces
kilograms	2.204	pounds
VOLUME		
fluid ounces	29.573	milliliters
pints	0.473	liters
quarts	0.946	liters
gallons (U.S.)	3.785	liters
milliliters	0.033	fluid ounces
liters	1.056	quarts
liters	0.264	gallons (U.S.)
TEMPERATURE		

°C = (°F - 32) x .555
°F = (°C x 1.8) + 32

Inches	Decimals of Foot	Milli-meters
1/16	.0052	1.5875
1/8	.0104	3.1750
3/16	.0156	4.7625
1/4	.0208	6.3500
5/16	.0260	7.9350
3/8	.0313	9.5250
1/2	.0417	12.700
5/8	.0521	15.875
3/4	.0625	19.050
7/8	.0729	22.225
1"	.0833	25.400
2"	.1667	50.800
3"	.2500	76.200
4"	.3333	101.60
5"	.4167	127.00
6"	.5000	152.40
7"	.5833	177.80
8"	.6667	203.20
9"	.7500	228.60
10"	.8333	254.00
11"	.9167	279.40
1 foot	1.0000	304.80

"Rite in the Rain" ®
ALL-WEATHER WRITING PAPER

Name Mike Gagner
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Redmond WA 98052
Phone 425/556-1288

Project 1442.01 PHABSIM Data

"Rite in the Rain" - a unique all-weather writing surface created to shed water and to enhance the written image. Makes it possible to write sharp, legible field data in any kind of weather.

a product of

J. L. DARLING CORPORATION
TACOMA, WA 98424-1017 USA
www.riteintherain.com

WD 3 CROOKED

6/27/04

	IN	OUT
TIME	9:15am	1.58
S.G	12:15pm	1.58

crew: C. Yoder A. Weybright

nice sunny day, no clouds

Equipment SW~~OFFSR~~ #5350 Prop 2B
cal = 123

TYPE	TR	RWP	LWP	RWE	LWE
Glide	1	1.0	61.1	14.10	41.8
Glide	2	1.0	64.3	19.5	53.8
Glide	3	1.0	49.5	16.0	46.7

PHOTO LOG CY #4

⑤ WD3 Glide TR1 LB to RB
④ WD3 Glide TR1 downstream
③ WD3 Glide TR1 upstream
② WD3 Glide TR1 RB to LB
① WD3 Glide TR2 LB to RB

CY #5

㉗ WD3 Glide TR2 RB to LB
㉖ WD3 Glide TR2 upstream
㉕ WD3 Glide TR2 downstream
㉔ WD3 Glide TR3 RB to LB
㉓ WD3 Glide TR3 upstream
㉒ WD3 Glide TR3 downstream
㉑ WD3 Glide TR3 LB to RB
⑳ WD3 ~~Glide~~ Staff Gage
⑲

LEVEL LOOP SURVEY 6/27/04

STA	BS	HI	FS	ELV	ROD
	3.56	103.56			
BM	3.~~74~~	103~~.74~~		100.00	
TR1			3.74	99.82	
TR3			4.09	99.47	
(TP)	3.~~93~~	103.~~40~~		~~99~~.47	
TR3	3.93	103.40		99.47	
TR1			3.58	99.82	
BM			3.40	100.00	
downstream ~95			7.07	96.33	
				96.37	
downstream ~95'			10.33	96~~.40~~	3.30
downstream ~95'			10.39	96.37	3.36
downstream ~95'			7.06	96.34	

STA	BS	HI	FS	ELV	ROD
upstream ~70' from TR3			6.57	96.83	
upstream ~70' from TR3			3.94	96.83	2.37

GLIDE TR 1

CROSS SECTIONAL PROFILE

6/27/04

STA	BS	HI	FS	ELV	ROD	DOM	SUB	%	COMMENTS
-7.0		103.4	3.35	100.05		Veg	Sand	70	RWP – 3'
-15.0			3.32	100.08		Veg	Sand	70	RWP – 16'
1.0			5.25	98.15		Veg	Sand	70	RWP
3.0			5.90	97.50		Veg	~~Sand~~ Silt	90	
8.0			6.25	97.15		Veg	Silt	90	
13.5			6.36	97.04		Veg	Silt	90	
14.0			6.62	96.78		Veg	Silt	80	RWE
			6.62	96.78					RWSE
			6.62	96.78					LWSE
41.8			6.61	96.79		Veg	Silt	80	LWE
43.0			6.59	96.81		Silt	Veg	70	
48.0			6.48	96.92		Veg	Silt	60	
53.0			6.25	97.15		Veg	Silt	80	
58.0			6.01	97.39		Veg	Silt	90	
61.1			5.82	97.58		Veg	Silt	90	LWP
73.1			5.61	97.79		Veg	Silt	90	LWP +12'

GLIDE TR1 *EST.

DISCHARGE SURVEY

STA	DEPTH	VEL	DOM	SUB	%	% overhead cover / COM
14.0	0	0	Veg	Silt	80	RWE
15.0	2.5 ~~#5~~	0.24/0.12	Sand	Silt	80	Instream Cover
16.0	2.72	0.79/0.73	Sand	sm. gravel	80	
17.0	2.92	0.88/0.78	sand	sm. gravel	60	
19.0	2.95	1.01/0.81	sand	sm. gravel	70	
19.0	2.93	0.89/0.89	sand	sm. gravel	70	
20.0	2.9	0.87/0.79	Sand	sm. gravel	80	
21.0	2.83	0.83/.80	Sand	sm. gravel	90	
22.0	2.78	0.84/0.84	Sand	sm. gravel	90	
23.0	2.72	0.85/0.84	Sand	sm. gravel	90	
24.0	2.55	0.81/0.84	Sand	sm. gravel	90	
25.0	2.4	0.86	Sand	sm gravel	90	
26.5	2.28	0.85	Sand		100	
28.0	1.93	0.85	Sand		100	
29.5	1.9	0.81	Sand		100	
31.0	1.75	0.75	sand	silt	~~80~~ 70	
32.5	1.58	0.7	Sand	silt	70	
34.0	1.47	0.65	Sand	silt	60	
~~34.8~~ 35.5	1.4	0.68	Sand	silt	60	
37.0	1.45	0.51	Sand	silt	60	
38.5	1.55	0.06	sand	silt	60	
40.0	1.62	0.25	sand	silt	60	
41.5	0.98	-0.03*	Veg	silt	60	
41.8	0	0	Veg	silt	~~80~~	LWE
61.6						LWP

TR2

CROSS SECTIONAL PROFILE

STA	BS	HI	FS	ELV	ROD
-11'		103.4	5.78	97.62	
1.0			5.93	97.47	
6.0			6.18	97.22	
11.0			6.27	97.13	
16.0			6.47	96.93	
19.0			6.36	97.04	
19.5			6.59	96.81	
			6.60	96.80	
			6.59	96.81	
53.8			6.60	96.80	
54.5			6.38	97.02	
59.0			6.07	97.33	
64.3			5.96	97.44	
94.3			6.08	97.32	

6/27/04

DOM	SUB	%	COMMENTS
Veg	Sand	90	RWP-6'
Veg	Sand	90	RWP
Veg	Sand	90	
Veg	Silt	80	
Veg	Silt	80	
Veg	Silt	70	
Silt	Veg	60	RWE
			RWSE
			LWSE
			LWE
Silt	Veg	60	
Veg	Silt	80	
Veg	Silt	90	
Veg	Silt	90	LWP
			LWP + 30'

GLIDE TR2

DISCHARGE SURVEY 6/27/04

STA	DEPTH	VEL	DOM	SUB	% COM	
1.0						RWP
19.5	0	0	Silt	Veg	60	RWE
19.7	0.2	0	Silt	Veg	70	
20.1	0	0	Veg	Silt to 0.1' humic		
20.6	0	0	Veg	Silt	60	
21.0	0.57	0	Silt	Veg	~~80~~ 90	instream overhead cover
22.5	0.73	0.05*	Silt	Sand	80	Note: base of rod sinking ~0.3'
24.0	0.95	0.01*	Silt	Sand	80	
25.5	1.2	0.42	Silt	Sand	80	
27.0	1.22	0.62	Silt	Sand	70	
28.5	1.2	0.61	Silt	Sand	70	
30.0	1.2	0.78	Silt	Sand	70	sinking ~0.1
31.5	1.28	0.63	Silt	Sand	70	
33.0	1.4	0.65	Silt	Sand	60	
34.5	1.47	0.70	~~Sand Silt~~	~~Silt Sand~~	60	
36.0	1.65	0.71	Sand	Silt	60	
37.5	1.9	0.77	Sand	Silt	60	
39.0	2.2	0.81	Sand	Silt	60	
40.5	2.47	0.88	Silt	Sand	60	
42.0	2.7	0.79/0.89	Silt	Sand	60	
43.5	2.72	0.76/0.83	Silt	Sand	60	
45.0	2.97	0.85/0.85	Sand	Silt	60	
46.5	3.15	0.9/0.85	Sand	Silt	60	

6/27/04

STA	DEPTH	VEL	DOM	SUB	% COM	
48.0	3.2	0.93/0.83	Sand	sm. gravel	80	
49.0	3.07	0.82/0.41	Sand	sm. gravel	80	
50.0	2.75	0.71/-0.04	sand	silt	80	instream overhead cover
51.0	2.8	-0.03/0.07	sand	silt	80	
51.7	2.85	0/0	sand	silt	80	
52.0	1.2	0	Silt	Veg	60	
53.0	0.6	0	Veg	Silt	60	
53.8	0	0	Silt	Veg	60	LWE
64.3						LWP

GLIDE TR 3

CROSS SECTIONAL PROFILE

STA	BS	HI	FS	ELV	ROD
-23'		103.4	5.60	97.8	
1.0			6.20	97.2	
5.0			6.35	97.05	
9.0			6.36	97.04	
13.0			6.58	96.82	
16.0			6.58	96.82	
			6.58	96.82	
			6.57	96.83	
46.7			6.57	96.83	
47.3			6.23	97.17	
48.4			4.76	98.64	
49.5			4.40	99.0	
~~51~~ 52.0			4.21	99.19	

6/27/03

DOM	SUB	%	COMMENTS
Veg	Sand	90	RWP-24'
Veg	Sand	90	RWP
Veg	Silt	90	
Veg	Silt	90	
Silt	veg	70	
Silt	veg	60	RWE
			RWSE
			LWSE
			LWE
Veg	Sand	90	
Veg	Sand	90	
Veg	Sand	90	
Veg	Sand	90	LWP
			LWP +2.5'

GLIDE TR 3

DISCHARGE SURVEY 6/27/04

STA	DEPTH	VEL	DOM	SUB	%	COM
1.0						RWP
16.0	0	0	silt	Veg	60	RWE
17.0	0.4	0	silt	Veg	70	instream OH cover
18.0	0.87	0.03	silt	sand	90	OH cover
19.0	0.92	0.18	Silt	Sand	90	
20.0	0.92	0.42	Silt	Sand	70	
21.5	1.08	0.72	~~Silt~~ sand	silt	70	
23.0	1.~~28~~ 32	0.8	Sand	silt	80	
24.5	1.68	0.86	Sand	silt	80	
26.0	2.08	0.71	Sand	silt	80	
27.5	2.4	0.8	Sand	silt	90	
29.0	2.57	0.42/0.78	Sand	Silt	90	
30.5	3.2	0.38/0.82	Sand	silt	90	
32.0	3.48	0.3 /0.84	Sand	sm. gravel	80	in front of Log instream cover
33.5	3.65	0.1 /0.83	Sand	sm. gravel	80	Log ⊥ to transect 32.5: instream cover
35.0	3.42	0.31 /0.8	Sand	silt	80	behind log
36.5	3.42	0.33/0.80	Sand	silt	70	
38.0	3.17	0.27/0.74	Sand	silt	60	
39.0	~~2.6~~ 2.75	.39/0.82	Sand	Silt	80	
41.0	2.25	0.48	Sand	silt	80	
42.5	2.12	0.54	Sand	sm. gravel	90	
44.0	1.73	0.22	Sand	sm. gravel	90	
45.5	1.25	0.1	Sand	bedrock	60	
46.7	0.6	-0.05	Veg	Sand	90	undercut .0.6'
46.1	0	0				

at 46.7 height of undercut = 0.7'

WD-3

"Rite in the Rain"

ALL-WEATHER

LEVEL BOOK

No. 310

Aug. 19, 2004

Survey

WD-3 Crooked Ck 8/19/04

	IN	OUT
TIME	8:30	11:00
SG	1.63	1.62

Sun, clear ~ 80°F High

Crew: Glen Anderson
Adam Weybright

Equip: Swoffer 5750
prop. 2B
Cal. 123

102 is 12
~~103.62~~ 103.62
3.79 4.15
99.83 99.47

99.47
4.22
103.69
6.87
96.82

WD-3 Crooked Ck 8/19/04
Level Loop *

STA	BS	HI	FS	ELEV
BM	3.62	103.62		100.00
TR1			3.79	99.83
TR3			4.15	99.47
TP				
TR3	4.22	103.69		99.47
TR1			3.86	99.83
BM			3.69	100.00
TR1	LWSE	103.69	6.87	96.82
	RWSE		6.87	
TR2	LWSE		6.86	
	RWSE		6.86	
TR3	LWSE		6.85	
	RWSE		6.85	

* No TR2 HP - ground too soft.

Crooked Ck. 8/19/04

Photo Log (Disposable Cam #2)

27	TR1	U/S
26	TR1	L-R
25	TR3	R-L
24	TR2	R-L

Crooked Ck. WD-3 8/19/04

TR1 Glide

STA	D	V	Comments
1.0	—	—	RWP
14.1	—	—	RWE
15	2.62	0.16 / 0.31	
16	2.80	0.71 / 0.89	
17	3.00	0.79 / 0.89	
18	3.00	0.85 / 0.87	
19	3.00	0.77 / 0.82	
20	2.95	0.81 / 0.84	
21	2.88	0.78 / 0.81	
22	2.82	0.82 / 0.75	
23	2.82	0.78 / 0.70	
24	2.65	0.87 / 0.73	
25	2.47	0.83	
26.5	2.22	0.85	
28	1.97	0.80	
29.5	1.90	0.83	
31	1.77	0.76	
32.5	1.62	0.71	
34	1.47	0.58	
35.5	1.45	0.21	
37	1.55	0.42	
38.5	1.65	0.25	
40	1.70	0.01	
41.5	0.88	⊖	
41.8	⊖	⊖	LWE
61.6	—	—	LWP

WD-3 8/19/04

TR 2 Glide

STA	D	V	comments
1.0	—	—	RWP
19.3	~~0~~	~~0~~	RWE
19.5	0.15	~~0~~	
19.8	~~0~~	~~0~~	(wet edges of grass Island
20.7	~~0~~	~~0~~	
21	0.5	~~0~~	
22.5	0.8	0.03*	* Est.
24	1.0	0.36	
25.5	1.35	0.44	
27	1.23	0.55	
28.5	1.38	0.60	
30	1.42	0.58	
31.5	1.25	0.72	
33	1.42	0.73	
34.5	1.52	0.74	
36	1.72	0.68	
37.5	1.95	0.62	
39	2.25	0.74	
40.5	2.52	0.78 / 0.67	
42	2.68	0.83 / 0.63	
43.5	2.72	0.87 / 0.70	
45	3.00	0.81 / 0.82	
46.5	3.18	0.89 / 0.85	
48	3.15	0.70 / 0.81	
49	2.95	0.27 / 0.78	

Grass Island (0.1' out)
19.8 – 20.7

WD-3

TR 2 (cont.) 8/19/04

STA	D	V	Comments
50	2.7	0.05* / 0.56	* Est. (in veg.)
51	2.75	-0.05* / -0.05*	*Est.
51.7	2.80	~~0~~	
52	1.32	~~0~~	
53	0.55	~~0~~	
54	~~0~~	~~0~~	LWE
64.3	—	—	LWP

53.8 D 0.5 V ~~0~~

WD-3 8/19/04

TR 3 Glide

STA	D	V	Comments
1.0			RWP
15.8	Ø	Ø	RWE
16	0.05	Ø	
17	0.4	Ø	
18	0.42	0.03*	
19	0.93		
20			
21.5			
23			
24.5			
26			
27.5			
29			
30.5			
32			

Quit

Meter Working almost same vel. the one of vel. Use the other sets.

Ga

Ex. 281-US-422
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