

10-30-2008

Ex. 277-US-419

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Stream: Williamson River  
 Site: 625 (HW97 to Klamath Lake)  
 Date: 9/19/1990  
 Habitat: Run

Flow: Low

(1) Level Loop Survey (BM & HP)

BM/HP (ft)	BS (ft)	HI (ft)	FS (ft)	Elev (ft)
BM	4.76	104.76		
HP1			8.10	96.66
HP2			5.10	99.66
HP3			6.30	98.46
TP				
HP3	6.24	104.70		
HP2			5.03	99.67
HP1			8.04	96.66
BM			4.70	100.00

Comment:

Date: 4/4/1991  
 Habitat: Run

Flow: Mid

(1) Level Loop Survey

BM/HP (ft)	BS (ft)	HI (ft)	FS (ft)	Elev (ft)
BM	6.11	106.11		
HP1			9.45	96.66
HP2			6.44	99.67
HP3			7.69	98.42
TP				
HP3	7.74	106.16		
HP2			6.50	99.66
HP1			9.51	96.65
BM			6.17	99.99

Comment:

Date: 5/12/1993  
 Habitat: Run

Flow: High

(1) Level Loop Survey

BM/HP (ft)	BS (ft)	HI (ft)	FS (ft)	Elev (ft)
BM	6.51	106.51		
HP1			9.88	96.63
HP2			6.85	99.66
HP3			8.10	98.41
TP				
HP3	8.18	106.59		
HP2			6.93	99.66
HP1			9.94	96.65
BM			6.60	99.99

Comment:

(2) Water Surface Elevation (WSE) Survey

	L/R WSE		Sta (ft)	HI (ft)	FS (ft)	Rod (ft)	WSE (ft)	Ave WSE (ft)	Q (cfs)
	LWSE	RWSE							
TR1	LWSE	13.10	0	102.18	13.10	0.00	89.08	89.08	415.0
	RWSE	13.10				0.00	89.08		
TR2	LWSE	16.04	200	105.15	16.04	0.00	89.11	89.10	544.6
	RWSE	16.06				0.00	89.09		
TR3	LWSE	15.96	400	105.10	15.96	0.00	89.14	89.14	341.8
	RWSE	15.96				0.00	89.14		

Note: WSEs of 9/19/90 survey need to be lowered by 0.01ft to compensate for BM movement (See Sheet "data entry notes" for more details)  
 WSE slope = 0.015%

(2) Water Surface Elevation (WSE) Survey

	L/R WSE		Sta (ft)	HI (ft)	FS (ft)	Rod (ft)	WSE (ft)	Ave WSE (ft)	Q (cfs)
	LWSE	RWSE							
TR1	LWSE	12.12	0	102.28	12.12	0.00	90.16	90.18	830.2
	RWSE	12.08				0.00	90.20		
TR2	LWSE	15.24	200	105.53	15.24	0.00	90.29	90.29	971.8
	RWSE	15.24				0.00	90.29		
TR3	LWSE	15.64	400	105.90	15.64	0.00	90.26	90.26	817.6
	RWSE	15.64				0.00	90.26		

Note: TR2 WSE > TR3 WSE, water flows uphill  
 WSE slope = 0.020%

(2) Water Surface Elevation (WSE) Survey

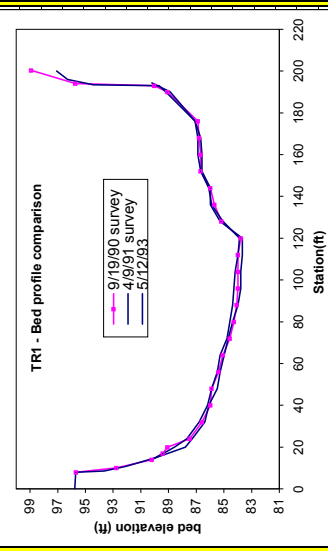
HI=

	L/R WSE		Sta (ft)	HI (ft)	FS (ft)	Rod (ft)	WSE (ft)	Ave WSE (ft)	Q (cfs)
	LWSE	RWSE							
TR1	LWSE	14.54	0	106.60	14.54	0.00	92.06	92.08	2267.1
	RWSE	14.50				0.00	92.10		
TR2	LWSE	14.45	200	106.60	14.45	0.00	92.15	92.15	
	RWSE	14.45				0.00	92.15		
TR3	LWSE	14.42	400	106.60	14.42	0.00	92.18	92.18	
	RWSE	14.43				0.00	92.17		

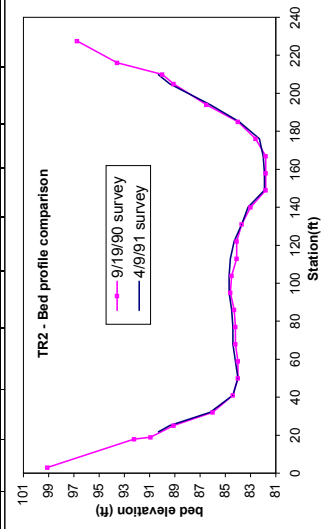
Note: Ave Q= 2267.1

WSE slope = 0.024%

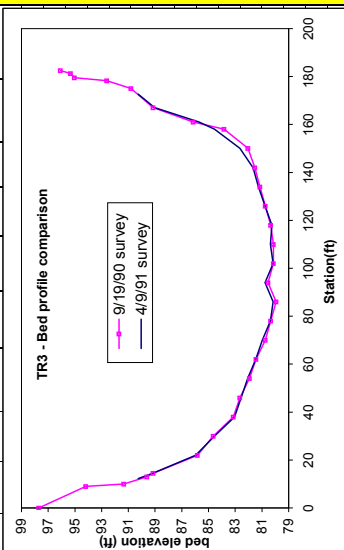
Stream: Williamson River		19-Sep-90							4-Apr-91							12-May-93						
Site: 625	Q (cfs)	Sta (ft)	FS (ft)	Ground (ft)	Depth (ft)	Vel (ft/s)	q (cfs)	substrate	Sta (ft)	FS (ft)	Ground (ft)	Depth (ft)	Vel (ft/s)	q (cfs)	substrate	Sta (ft)	FS (ft)	Ground (ft)	Depth (ft)	Vel (ft/s)	q (cfs)	substrate
Transsect: I	Date					V <sub>0.2,0.6</sub>	Ave						V <sub>0.2,0.6</sub>	Ave						V <sub>0.2,0.6</sub>	Ave	
Habitat: Run																						
Survey	HI	8.0	6.50	95.68				1.3														
Date	Q (cfs)	10.0	9.42	92.76				1.3														
9/19/1990	102.18	14.0	11.97	90.21				1.3														
4/4/1991	102.28	17.0	12.76	89.42				1.3														
5/12/1993	106.60	20.0		89.08	0.00	0.00	0.00	0.00	14.1	12.12	90.16	0.00	0.00	0.00	0.00	1.3						
		24.0		87.48	1.60	0.06	0.32	1.82	20.0	88.58	88.58	1.60	0.00	0.00	0.00	9.3						
		32.0		86.58	2.50	0.34	0.20	5.40	24.0	87.68	87.68	2.50	0.70	10.50	8.5							
		40.0		85.98	3.10	0.52	0.42	11.66	32.0	86.78	86.78	3.40	1.00	1.10	28.56	8.5						
		48.0		85.88	3.20	0.56	0.00	7.17	40.0	86.18	86.18	4.00	0.90	0.80	27.20	8.6						
		56.0		85.38	3.70	0.71	0.53	18.35	48.0	85.88	85.88	4.30	0.90	0.50	24.08	8.6						
		64.0		84.58	4.00	0.85	0.51	21.76	56.0	85.48	85.48	4.70	0.90	0.80	31.96	8.6						
		72.0		84.58	4.50	0.91	0.75	29.88	64.0	85.28	85.28	4.90	1.20	0.80	39.20	8.6						
		80.0		84.28	4.80	1.09	0.61	32.64	72.0	84.78	84.78	5.40	1.40	1.10	54.00	8.6						
		88.0		84.08	5.00	1.12	0.68	36.00	80.0	84.38	84.38	5.80	1.50	1.10	58.24	8.6						
		96.0		83.98	5.10	1.08	0.86	39.58	88.0	84.18	84.18	6.00	1.40	1.30	64.80	8.6						
		104.0		83.98	5.10	1.16	0.86	41.21	96.0	83.98	83.98	6.20	1.40	1.30	66.96	8.6						
		112.0		83.78	5.30	0.70	0.92	34.34	104.0	83.88	83.88	6.30	1.40	1.10	63.00	8.8						
		120.0		85.18	3.90	0.80	0.62	22.15	112.0	83.68	83.68	6.30	1.20	1.10	41.28	8.8						
		128.0		85.68	3.40	0.77	0.66	19.45	120.0	86.68	86.68	3.50	1.20	1.00	30.80	8.8						
		136.0		85.98	3.10	0.83	0.56	17.24	128.0	86.88	86.88	3.30	1.20	0.90	27.72	8.8						
		144.0		86.68	2.40	0.63	0.63	12.10	136.0	87.08	87.08	3.10	0.80	0.60	23.87	8.8						
		152.0		86.78	2.30	0.28	0.54	10.37	144.0	88.88	88.88	3.00	0.10	0.10	1.19	3.2						
		160.0		86.78	2.20	0.36	0.36	8.71	152.0	90.20	90.20	0.00	0.00	0.00	0.00	1.3						
		168.0		89.08	0.00	0.00	0.00	0.00	160.0	90.20	90.20	0.00	0.00	0.00	0.00	1.3						
		176.0		90.02				3.2	176.0	90.20	90.20	0.00	0.00	0.00	0.00	1.3						
		184.0		95.73				1.3	190.0	90.20	90.20	0.00	0.00	0.00	0.00	1.3						
		192.0		98.92				1.3	193.0	90.20	90.20	0.00	0.00	0.00	0.00	1.3						
		196.0							194.0	90.20	90.20	0.00	0.00	0.00	0.00	1.3						
		200.0							200.3	90.20	90.20	0.00	0.00	0.00	0.00	1.3						



Stream: Williamson River	19-Sep-90										4-Apr-91										12-May-93																					
	Site: 625	Transsect: 2	Habitat: Run	Survey	Date	HI	Q	Sta (ft)	FS (ft)	Ground (ft)	Depth (ft)	Vel (ft/s)	V <sub>0.206</sub>	V <sub>0.8</sub>	Ave	q (cfs)	substrate	Sta (ft)	FS (ft)	Ground (ft)	Depth (ft)	Vel (ft/s)	V <sub>0.206</sub>	V <sub>0.8</sub>	Ave	q (cfs)	substrate	Sta (ft)	FS (ft)	Ground (ft)	Depth (ft)	Vel (ft/s)	V <sub>0.206</sub>	V <sub>0.8</sub>	Ave	q (cfs)	substrate					
				LWP																																						
								3	6.06	99.09																																
								18	12.93	92.22																																
								19	14.23	90.92																																
								LWE	25	16.04	89.11	0.00	0.00																													
								32		86.00	3.10	0.08	0.14	0.11	2.73	7.5																										
								41		84.40	4.70	0.08	0.00	0.04	1.69	7.5																										
								50		84.00	5.10	0.09	0.00	0.05	2.07	6.3																										
								59		84.00	5.10	0.14	0.20	0.17	7.80	6.3																										
								68		84.20	4.90	0.64	0.57	0.61	26.68	6.3																										
								77		84.20	4.90	1	1.19	1.10	48.29	6.3																										
								86		84.30	4.80	1.37	1.20	1.29	55.51	6.3																										
								95		84.60	4.50	1.48	1.35	1.42	57.31	6.3																										
								104		84.50	4.60	0.95	1.24	1.10	45.33	6.3																										
								113		84.10	5.00	0.70	1.10	0.90	40.50	6.3																										
								122		84.10	5.00	0.38	1.13	0.76	33.98	6.3																										
								131		83.70	5.40	0.53	0.80	0.67	32.32	6.3																										
								140		83.00	6.10	0.42	0.70	0.56	30.74	6.3																										
								149		81.80	7.30	0.75	0.94	0.85	55.52	6.3																										
								158		81.80	7.30	0.76	0.78	0.77	50.59	7.3																										
								167.0		81.80	7.30	0.38	0.10	0.24	15.77	7.3																										
								176.0		82.60	6.50	0.20	0.34	0.27	15.80	7.3																										
								185.0		84.00	5.10	0.40	0.35	0.38	17.21	3.9																										
								194.0		86.50	2.60	0.15	0.22	0.19	4.81	3.9																										
								RWE	205.0	16.06	89.09	0.00	0.00																													
									210.0	15.14	90.01																															
									216.0	11.58	93.57																															
									RWP	227.5	8.40	96.75																														



Stream: Williamson River	19-Sep-90										4-Apr-91										12-May-93									
	Sta (ft)	FS (ft)	Ground (ft)	Depth (ft)	V <sub>0.2/0.6</sub> (ft/s)	V <sub>0.8</sub> Ave	q (cfs)	substrate	Sta (ft)	FS (ft)	Ground (ft)	Depth (ft)	V <sub>0.2/0.6</sub> (ft/s)	V <sub>0.8</sub> Ave	q (cfs)	substrate	Sta (ft)	FS (ft)	Ground (ft)	Depth (ft)	V <sub>0.2/0.6</sub> (ft/s)	V <sub>0.8</sub> Ave	q (cfs)	substrate						
LWP	0.0	7.40	97.70																											
Survey	9.0	10.92	94.18																											
Date	10	13.76	91.34																											
9/19/1990	105.10	341.8																												
4/4/1991	105.90	817.6																												
5/7/1993	106.60																													
	22	85.84	3.30	0.13	0.11	0.12	3.07	3.5																						
	30	84.64	4.50	0.34	0.32	0.33	11.88	3.9																						
	38	83.14	6.00	0.24	0.30	0.27	12.96	3.9																						
	46	82.64	6.50	0.36	0.30	0.33	17.16	3.5																						
	54	81.94	7.20	0.20	0.23	0.22	12.38	3.5																						
	62	81.44	7.70	0.5	0.28	0.39	24.02	3.5																						
	70	80.74	8.40	0.6	0.20	0.40	26.88	3.5																						
	78	80.34	8.80	0.44	0.49	0.47	32.74	3.5																						
	86	79.94	9.20	0.6	0.25	0.43	31.28	3.5																						
	94	80.54	8.60	0.43	0.52	0.48	32.68	3.5																						
	102	80.14	9.00	0.63	0.53	0.58	41.76	3.5																						
	110	80.14	9.00	0.54	0.25	0.40	28.44	3.5																						
	118	80.34	8.80	0.47	0.29	0.38	26.75	3.5																						
	126	80.74	8.40	0.41	0.24	0.33	21.84	3.5																						
	134	81.14	8.00	0.28	0.02	0.15	9.60	3.5																						
	142	81.54	7.60	0.02	0.05	0.04	2.13	3.5																						
	150	82.04	7.10	0.02	0.03	0.03	1.42	9.3																						
	158.0	83.84	5.30	0.12	0.13	0.13	3.64	9.3																						
	161.0	86.14	3.00	0.08	0.09	0.09	1.15	9.3																						
	167.0	15.96	89.14	0.00	0.00	0.00	0.00	1.3																						
	175.0	14.30	90.80					1.3																						
	178.3	12.48	92.62					1.3																						
	179.5	10.06	95.04					1.3																						
	181.3	9.78	95.32					1.3																						
	182.5	9.02	96.08					1.3																						



RUN MID  
 IOC 1101100000001000101000

TRANSECT 1

QARD 200.0  
 QARD 250.0  
 QARD 300.0  
 QARD 350.0  
 QARD 400.0  
 QARD 433.8  
 QARD 500.0  
 QARD 600.0  
 QARD 650.0  
 QARD 700.0  
 QARD 750.0  
 QARD 800.0  
 QARD 873.2  
 QARD1000.0  
 QARD1100.0  
 QARD1200.0  
 QARD1300.0  
 QARD1400.0  
 QARD1500.0  
 QARD1600.0  
 QARD1700.0  
 QARD1800.0  
 QARD1900.0  
 QARD2000.0  
 QARD2267.1  
 QARD2400.0  
 QARD2600.0  
 QARD2800.0  
 QARD3000.0  
 QARD3200.0  
 XSEC1000.0 0.00 1.0 83.88 0.0002  
 1000.0 8.0 95.7 10.0 92.8 14.0 90.2 14.1 90.2 20.0 88.6 24.0 87.7  
 1000.0 32.0 86.8 40.0 86.2 48.0 85.9 56.0 85.5 64.0 85.3 72.0 84.8  
 1000.0 80.0 84.6 88.0 84.4 96.0 84.3104.0 84.2112.0 84.0120.0 83.9  
 1000.0128.0 85.1136.0 85.9144.0 86.1152.0 86.7160.0 86.9168.0 86.9  
 1000.0176.0 87.1190.0 88.9194.3 90.2200.3 98.9  
 NS 1000.0 1.3 1.3 1.3 0.5 1.3 0.10 9.3 8.5  
 NS 1000.0 8.5 8.6 8.6 8.6 8.6 8.6 8.6  
 NS 1000.0 8.6 8.6 8.6 8.6 8.6 8.6 8.8  
 NS 1000.0 8.8 8.8 8.8 8.8 8.8 8.8 8.8  
 NS 1000.0 8.8 0.12 3.2 1.3 1.3  
 CAL11000.0 90.18 873.2  
 VEL11000.0 0.00 .001 0.70 1.05 0.85 0.70 0.85 1.00 1.25  
 VEL11000.0 1.30 1.30 1.50 1.35 1.35 1.25 1.15 1.20 1.15 1.10 1.05 0.80  
 VEL11000.0 0.70 0.10 0.00  
 CAL21000.0 89.07 433.8  
 VEL21000.0  
 VEL21000.0  
 VEL21000.0  
 CAL31000.0 92.08 2267.1  
 VEL31000.0  
 VEL31000.0  
 VEL31000.0  
 ENDJ

RUN

MID

TRANSECT 2

IOC 1101100100001000101000

QARD 200.0  
 QARD 250.0  
 QARD 300.0  
 QARD 350.0  
 QARD 400.0  
 QARD 433.8  
 QARD 500.0  
 QARD 600.0  
 QARD 650.0  
 QARD 700.0  
 QARD 750.0  
 QARD 800.0  
 QARD 873.2  
 QARD1000.0  
 QARD1100.0  
 QARD1200.0  
 QARD1300.0  
 QARD1400.0  
 QARD1500.0  
 QARD1600.0  
 QARD1700.0  
 QARD1800.0  
 QARD1900.0  
 QARD2000.0  
 QARD2267.1  
 QARD2400.0  
 QARD2600.0  
 QARD2800.0  
 QARD3000.0  
 QARD3200.0

XSEC1000.0 0.00 1.0 83.88 0.0002  
 1000.0 3.0 99.1 18.0 92.2 19.0 90.9 21.8 90.3 25.0 89.4 32.0 86.2  
 1000.0 41.0 84.4 50.0 84.0 59.0 84.2 68.0 84.4 77.0 84.4 86.0 84.5  
 1000.0 95.0 84.7104.0 84.7113.0 84.6122.0 84.3131.0 83.7140.0 83.2  
 1000.0149.0 81.9158.0 81.9167.0 82.0176.0 82.3185.0 83.9194.0 86.2  
 1000.0205.0 89.4209.8 90.3210.0 90.0216.0 93.6227.5 96.8  
 NS 1000.0 1.3 1.3 .035 1.3 .035 1.3 .035 7.5 7.5  
 NS 1000.0 7.5 0.15 6.3 6.3 6.3 6.3 6.3  
 NS 1000.0 6.3 6.3 6.3 6.3 6.3 .08 6.3  
 NS 1000.0 6.3 7.3 0.15 7.3 .25 7.3 .30 3.9 .3 3.9  
 NS 1000.0 0.3 1.3 1.3 1.3 1.3 1.3  
 WSL 1000.0 88.10 88.37 88.60 88.80 88.99 89.10  
 WSL 1000.0 89.32 89.60 89.72 89.85 89.96 90.07  
 WSL 1000.0 90.22 90.47 90.64 90.81 90.96 91.12  
 WSL 1000.0 91.26 91.39 91.51 91.63 91.75 91.87  
 WSL 1000.0 92.15 92.28 92.48 92.65 92.82 92.99  
 CAL11000.0 90.29 873.2  
 VEL11000.0 0.00 0.60 0.45 0.55 0.40 0.70 0.95 1.40 1.45  
 VEL11000.0 1.50 1.50 1.45 1.20 1.00 0.85 1.35 1.40 0.45 0.10 0.15 0.05  
 VEL11000.0 .001 0.00  
 CAL21000.0 89.10 433.8  
 VEL21000.0  
 VEL21000.0  
 VEL21000.0  
 CAL31000.0 92.15 2267.1  
 VEL31000.0  
 VEL31000.0  
 VEL31000.0  
 ENDJ

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RUN                      MID                      TRANSECT 3
IOC      1101100100001000101000
QARD 200.0
QARD 250.0
QARD 300.0
QARD 350.0
QARD 400.0
QARD 433.8
QARD 500.0
QARD 600.0
QARD 650.0
QARD 700.0
QARD 750.0
QARD 800.0
QARD 873.2
QARD1000.0
QARD1100.0
QARD1200.0
QARD1300.0
QARD1400.0
QARD1500.0
QARD1600.0
QARD1700.0
QARD1800.0
QARD1900.0
QARD2000.0
QARD2267.1
QARD2400.0
QARD2600.0
QARD2800.0
QARD3000.0
QARD3200.0
XSEC1000.0      0.00 1.0      83.88  0.0002
1000.0  0.0 97.7  9.0 94.2 10.0 91.3 12.2 90.3 14.5 89.2 22.0 86.0
1000.0 30.0 84.6 38.0 83.1 46.0 82.6 54.0 82.1 62.0 81.5 70.0 81.0
1000.0 78.0 80.4 86.0 80.2 94.0 80.8102.0 80.2110.0 80.4118.0 80.3
1000.0126.0 80.8134.0 81.3142.0 81.7150.0 82.7158.0 84.6161.0 85.7
1000.0167.0 89.0172.6 90.3175.0 90.8178.3 92.6179.5 95.0181.3 95.3
1000.0182.5 96.1
NS 1000.0      2.1      2.1      3.3 0.2  3.5      3.5
NS 1000.0      3.9      3.9      3.5      3.5      3.5      3.5
NS 1000.0      3.5 .13  3.5      3.5      3.5      3.5      3.5
NS 1000.0      3.5      3.5 .25  3.5 0.7  9.3 0.9  9.3 1.2  9.3
NS 1000.0 1.5  9.3      1.3      1.3      1.3      1.3      1.3
NS 1000.0      1.3
WSL 1000.0      88.11      88.38      88.61      88.81      89.01      89.12
WSL 1000.0      89.33      89.62      89.74      89.87      89.98      90.09
WSL 1000.0      90.25      90.49      90.66      90.84      90.99      91.14
WSL 1000.0      91.29      91.42      91.54      91.66      91.79      91.90
WSL 1000.0      92.18      92.32      92.51      92.69      92.86      93.03
CAL11000.0      90.26      873.2
VEL11000.0      0.00 .001 0.30 0.70 0.75 0.65 0.75 0.75 0.90
VEL11000.0 0.85 0.70 0.90 1.00 0.90 0.80 0.65 0.65 0.28 .001 .001 .001
VEL11000.0 .001 0.00
CAL21000.0      89.14      433.8
VEL21000.0
VEL21000.0
VEL21000.0
CAL31000.0      92.18      2267.1
VEL31000.0
VEL31000.0
VEL31000.0
ENDJ

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