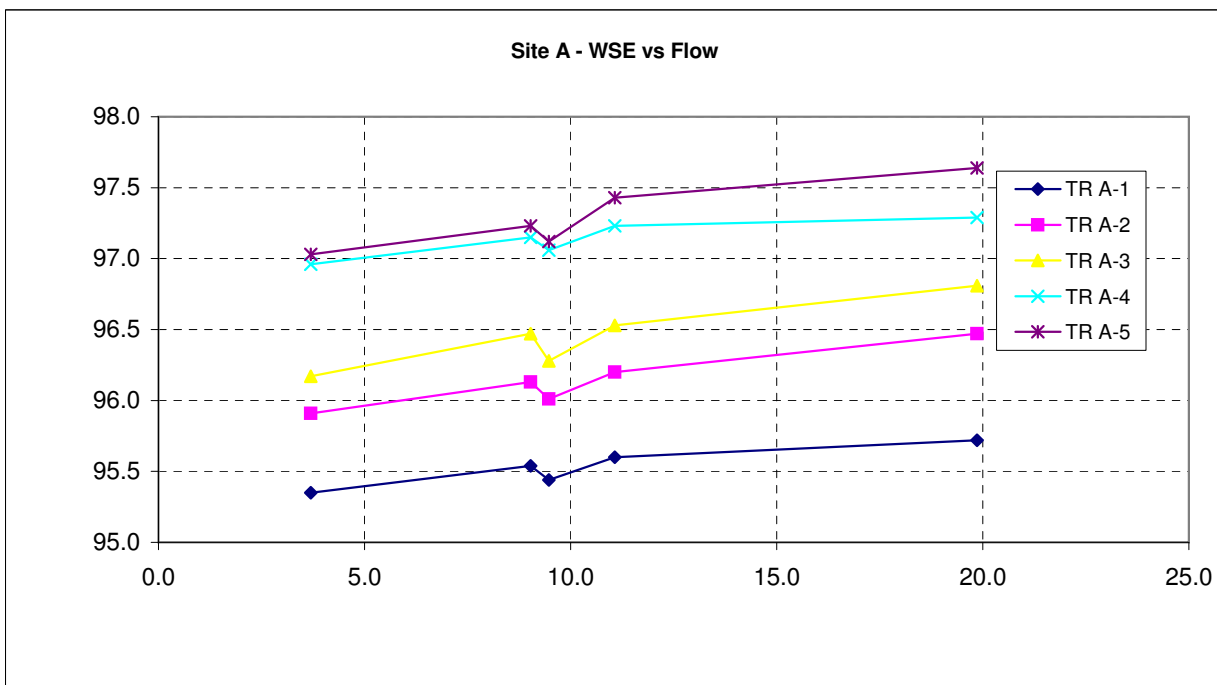
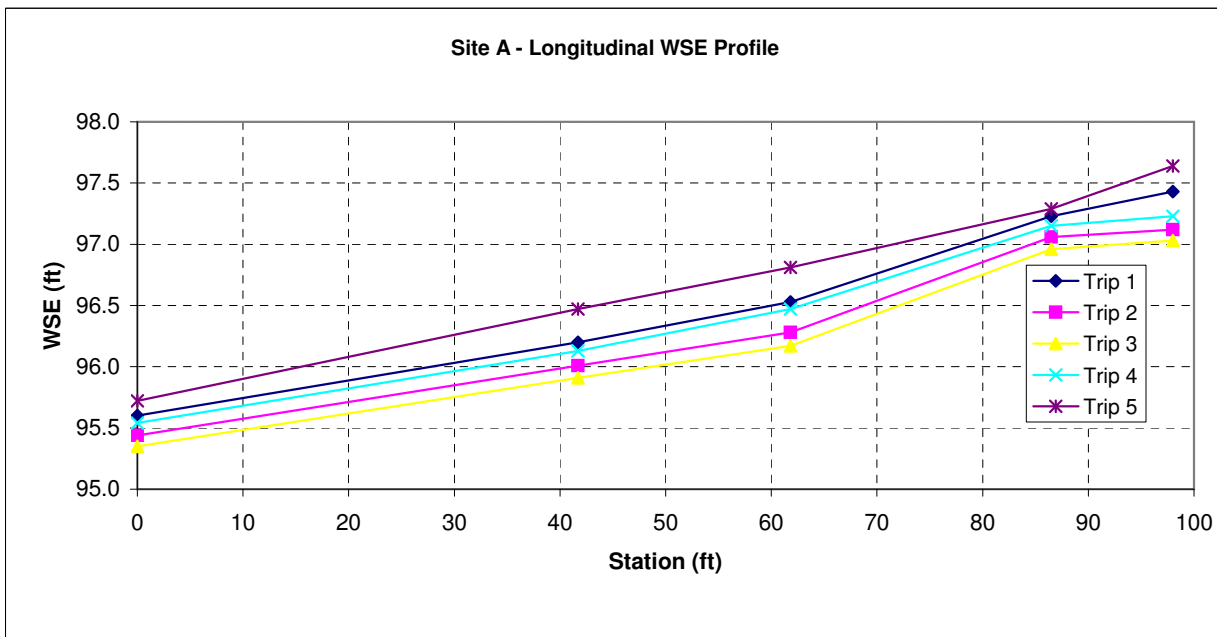


Reach: **Stetson Reach**  
 Stream: **Cooper Lake**  
 Site: **Site A**  
 Habitat Type: **Riffle**

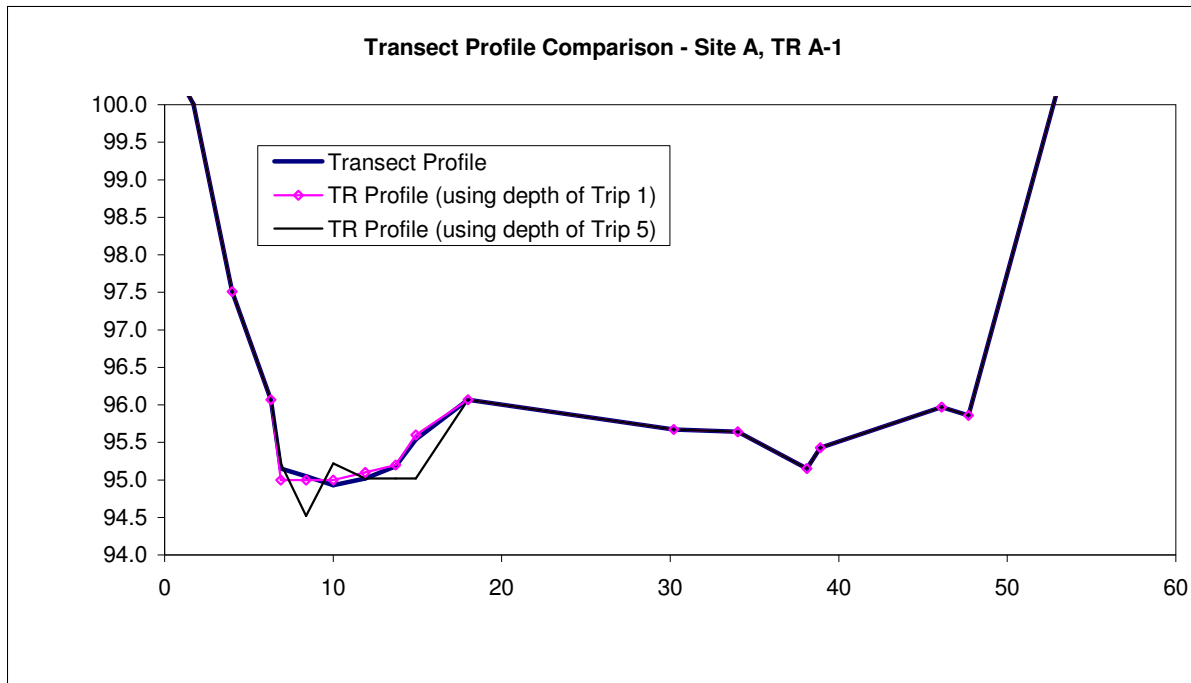
			Q(cfs)					Vel-Depth Survey				
			3.7	9.0	9.5	11.1	19.9					
			WSE (ft)									
TR	length	Sta	Trip 3	Trip 4	Trip 2	Trip 1	Trip 5	Trip 3	Trip 4	Trip 2	Trip 1	Trip 5
TR A-1	-	0.0	95.35	95.54	95.44	95.60	95.72				Y	Y
TR A-2	41.7	41.7	95.91	96.13	96.01	96.20	96.47				Y	Y
TR A-3	20.1	61.8	96.17	96.47	96.28	96.53	96.81				Y	Y
TR A-4	24.7	86.5	96.96	97.15	97.06	97.23	97.29				Y	Y
TR A-5	11.5	98.0	97.03	97.23	97.12	97.43	97.64				Y	Y
Average WSE slope			1.71%	1.72%	1.71%	1.87%	1.96%					



**Transect profile Comparison - Site A, TR A-1**

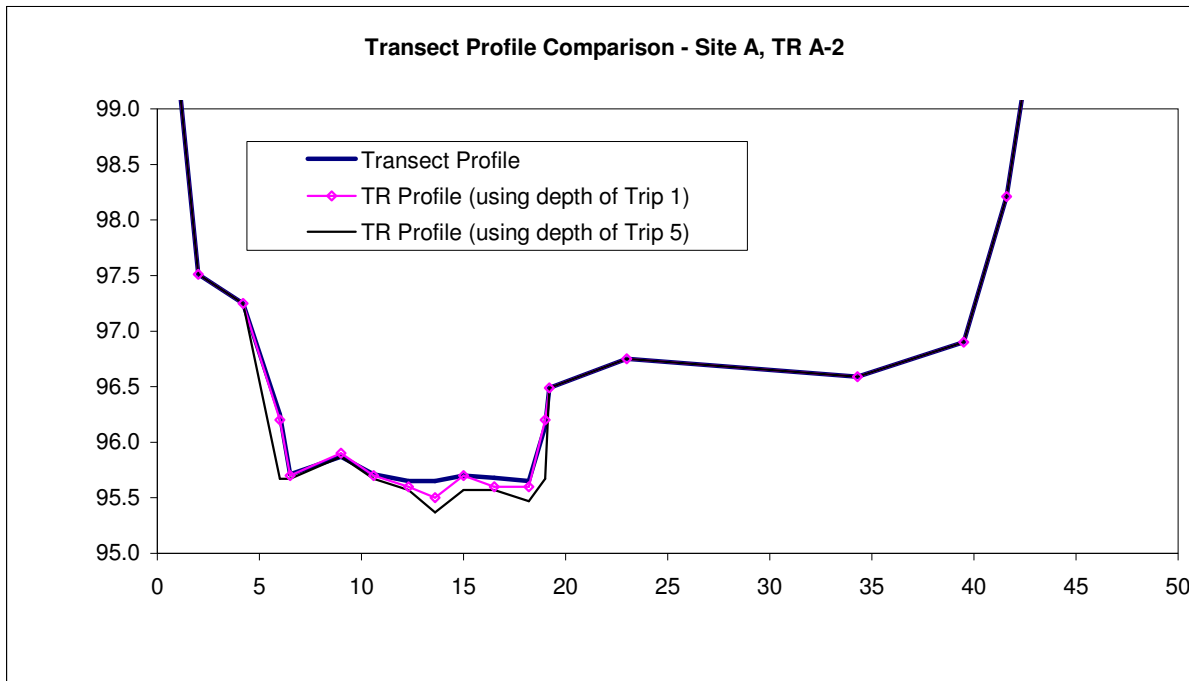
Trip 1							Trip 5						
Sta (ft)	HI (ft)	FS (ft)	Elev (ft)	Depth (ft)	Velocity (ft/s)	q (cfs)	Bed Elev (ft)	Depth (ft)	Velocity (ft/s)	q (cfs)	Bed Elev (ft)	subs	code
0.0	102.17	1.46	100.71				100.71				100.71	org	0
1.7	102.17	2.16	100.01				100.01				100.01	org	0
4.0	102.17	4.66	97.51				97.51				97.51	org	0
6.3	102.17	6.10	96.07				96.07				96.07	org	0
6.9	102.17	7.02	95.15	0.6	1.3	0.59	95.00	0.5	0.1	0.04	95.22	bed	8
8.4	102.17	7.12	95.05	0.6	3.7	3.44	95.00	1.2	1.3	2.42	94.52	512	7
10.0	102.17	7.24	94.93	0.6	3.9	4.10	95.00	0.5	3.9	3.41	95.22	90	5
11.9	102.17	7.15	95.02	0.5	2.6	2.41	95.10	0.7	4.6	5.96	95.02	512	7
13.7	102.17	6.99	95.18	0.4	1.7	1.02	95.20	0.7	2.7	2.84	95.02	45	4
14.9	102.17	6.63	95.54	0	0	0.00	95.60	0.7	1.6	1.96	95.02	org	0
18.0	102.17	6.10	96.07				96.07				96.07	org	0
30.2	102.17	6.50	95.67				95.67				95.67	org	0
34.0	102.17	6.53	95.64				95.64				95.64	org	0
38.1	102.17	7.02	95.15				95.15				95.15	org	0
38.9	102.17	6.74	95.43				95.43				95.43	org	0
46.1	102.17	6.20	95.97				95.97				95.97	org	0
47.7	102.17	6.31	95.86				95.86				95.86	org	0
53.3	102.17	1.71	100.46				100.46				100.46	org	0
55.0	102.17	1.63	100.54				100.54				100.54	org	0

TR Q (cfs)= 11.5
TR Q (cfs)= 16.6



**Transect profile Comparison - Site A, TR A-2**

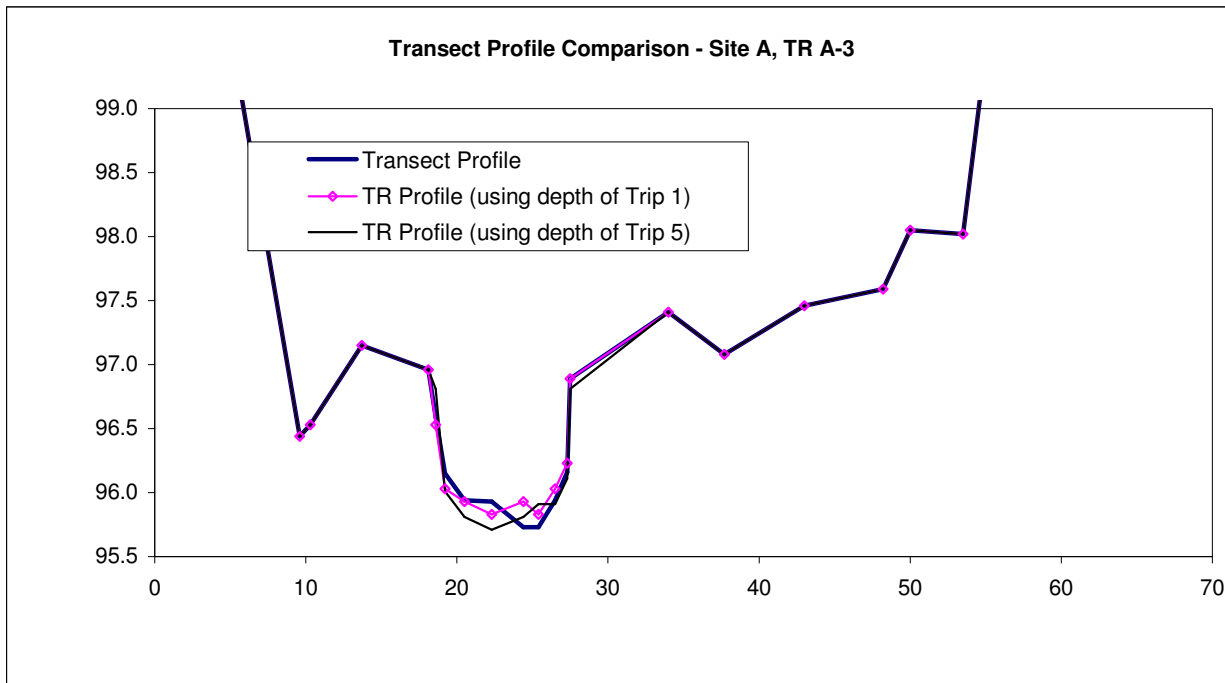
Sta (ft)	HI (ft)	FS (ft)	Trip 1				Bed Elev (ft)	Trip 5				subs	code
			Elev (ft)	Depth (ft)	Velocity (ft/s)	q (cfs)		Depth (ft)	Velocity (ft/s)	q (cfs)	Bed Elev (ft)		
0	104.6	3.4	101.2				101.20					org	0
2	104.6	7.09	97.51				97.51					org	0
4.2	104.6	7.35	97.25				97.25					org	0
6	104.6	8.35	96.25	0	0	0.00	96.20	0.8	0	0.00	95.67	silt	1
6.5	104.6	8.89	95.71	0.5	0	0.00	95.70	0.8	0	0.00	95.67	silt	1
9	104.6	8.73	95.87	0.3	0.2	0.12	95.90	0.6	0.4	0.49	95.87	6	2
10.6	104.6	8.89	95.71	0.5	1.6	1.32	95.70	0.8	2.8	3.70	95.67	23	3
12.3	104.6	8.95	95.65	0.6	2	1.80	95.60	0.9	2.3	3.11	95.57	32	3
13.6	104.6	8.95	95.65	0.7	1.9	1.80	95.50	1.1	2.3	3.42	95.37	32	3
15	104.6	8.9	95.7	0.5	2.1	1.52	95.70	0.9	2.1	2.74	95.57	23	3
16.5	104.6	8.92	95.68	0.6	2	1.92	95.60	0.9	2.4	3.46	95.57	64	4
18.2	104.6	8.95	95.65	0.6	1.7	1.28	95.60	1	1.8	2.25	95.47	45	4
19	104.6	8.46	96.14	0	0	0.00	96.20	0.8	0.3	0.10	95.67	16	3
19.2	104.6	8.11	96.49				96.49				96.49	org	0
23	104.6	7.85	96.75				96.75				96.75	org	0
34.3	104.6	8.01	96.59				96.59				96.59	org	0
39.5	104.6	7.7	96.9				96.90				96.90	org	0
41.6	104.6	6.39	98.21				98.21				98.21	org	0
43.1	104.6	4.62	99.98				99.98				99.98	org	0
				TR Q (cfs)= <b>9.8</b>				TR Q (cfs)= <b>19.3</b>					



**Transect profile Comparison - Site A, TR A-3**

Sta (ft)	HI (ft)	FS (ft)	Trip 1				Trip 5				subs	code	
			Elev (ft)	Depth (ft)	Velocity (ft/s)	q (cfs)	Bed Elev (ft)	Depth (ft)	Velocity (ft/s)	q (cfs)			Bed Elev (ft)
0	104.6	1.55	103.05				103.05				103.05	org	0
9.6	104.6	8.16	96.44				96.44				96.44	org	0
10.3	104.6	8.07	96.53				96.53				96.53	org	0
13.7	104.6	7.45	97.15				97.15				97.15	org	0
18.1	104.6	7.64	96.96				96.96				96.96	org	0
18.6	104.6	8.01	96.59	0	0	0.00	96.53	0.00	0.00	0.00	96.81	org	0
19.2	104.6	8.45	96.15	0.5	0.8	0.38	96.03	0.80	0.40	0.30	96.01	4	2
20.5	104.6	8.66	95.94	0.6	1.8	1.67	95.93	1.00	1.60	2.48	95.81	45	4
22.3	104.6	8.67	95.93	0.7	2.2	3.00	95.83	1.10	3.20	6.86	95.71	45	4
24.4	104.6	8.87	95.73	0.6	3.7	3.44	95.93	1.00	3.80	5.89	95.81	64	4
25.4	104.6	8.87	95.73	0.7	2.4	1.76	95.83	0.90	2.10	1.98	95.91	bed	8
26.5	104.6	8.66	95.94	0.5	1	0.48	96.03	0.90	2.90	2.48	95.91	512	7
27.3	104.6	8.44	96.16	0.3	0	0.00	96.23	0.70	0.90	0.32	96.11	org	0
27.5	104.6	7.71	96.89				96.89	0.00	0.00	0.00	96.81	org	0
34	104.6	7.19	97.41				97.41				97.41	org	0
37.7	104.6	7.52	97.08				97.08				97.08	org	0
43	104.6	7.14	97.46				97.46				97.46	org	0
48.2	104.6	7.01	97.59				97.59				97.59	org	0
50	104.6	6.55	98.05				98.05				98.05	org	0
53.5	104.6	6.58	98.02				98.02				98.02	64	4
58.5	104.6	1.85	102.75				102.75				102.75	6	2

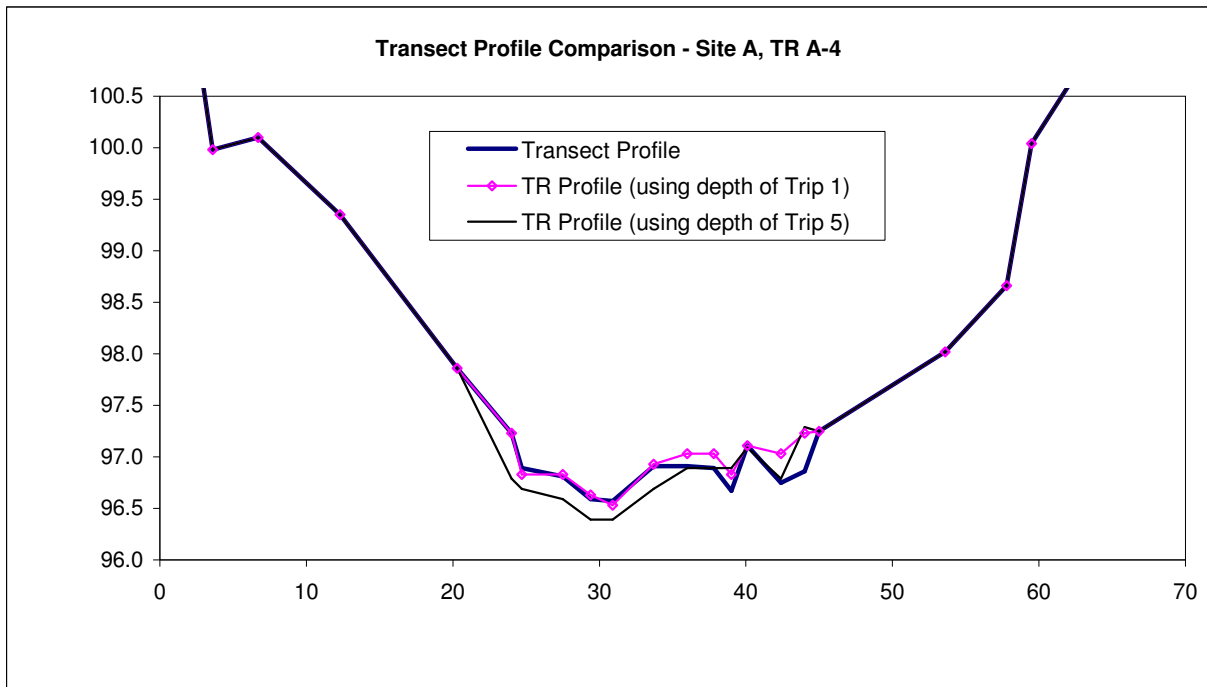
TR Q (cfs)= **10.7**                      TR Q (cfs)= **20.3**



**Transect profile Comparison - Site A, TR A-4**

Sta (ft)	HI (ft)	FS (ft)	Trip 1				Bed Elev (ft)	Trip 5				subs	code
			Elev (ft)	Depth (ft)	Velocity (ft/s)	q (cfs)		Depth (ft)	Velocity (ft/s)	q (cfs)	Bed Elev (ft)		
0	104.6	1.15	103.45				103.45					org	0
3.6	104.6	4.62	99.98				99.98					org	0
6.7	104.6	4.5	100.1				100.10					org	0
12.3	104.6	5.25	99.35				99.35					org	0
20.3	104.6	6.74	97.86				97.86					org	0
24	104.6	7.37	97.23	0.00	0.00	0.00	97.23	0.5	0.7	0.42	96.79	sand	1
24.7	104.6	7.71	96.89	0.40	1.50	1.05	96.83	0.6	1.3	1.37	96.69	sand	1
27.5	104.6	7.79	96.81	0.40	2.50	2.35	96.83	0.7	2.4	3.95	96.59	90	5
29.4	104.6	8.01	96.59	0.60	3.50	3.57	96.63	0.9	3.3	5.05	96.39	64	4
30.9	104.6	8.03	96.57	0.70	2.70	4.06	96.53	0.9	3.6	6.97	96.39	32	3
33.7	104.6	7.69	96.91	0.30	1.90	1.45	96.93	0.6	2.1	3.21	96.69	32	3
36	104.6	7.69	96.91	0.20	0.70	0.29	97.03	0.4	1.2	0.98	96.89	23	3
37.8	104.6	7.71	96.89	0.20	0.70	0.21	97.03	0.4	1.6	0.96	96.89	23	3
39	104.6	7.93	96.67	0.40	0.10	0.05	96.83	0.4	0.0	0.00	96.89	8	2
40.1	104.6	7.49	97.11				97.11	0.2	0.0	0.00	97.09	org	0
42.4	104.6	7.85	96.75	0.20	0.00	0.00	97.03	0.5	0.0	0.00	96.79	org	0
44	104.6	7.74	96.86	0.00	0.00	0.00	97.23	0.0	0.0	0.00	97.29	org	0
45	104.6	7.35	97.25				97.25				97.25	org	0
53.6	104.6	6.58	98.02				98.02				98.02	org	0
57.8	104.6	5.94	98.66				98.66				98.66	bed	8
59.5	104.6	4.56	100.04				100.04				100.04	32	3
62	104.6	4	100.6				100.60				100.60	23	3
63.9	104.6	3.08	101.52				101.52				101.52	16	3
65.8	104.6	0.93	103.67				103.67				103.67	bed	8

TR Q (cfs)= **13.0**                      TR Q (cfs)= **22.9**

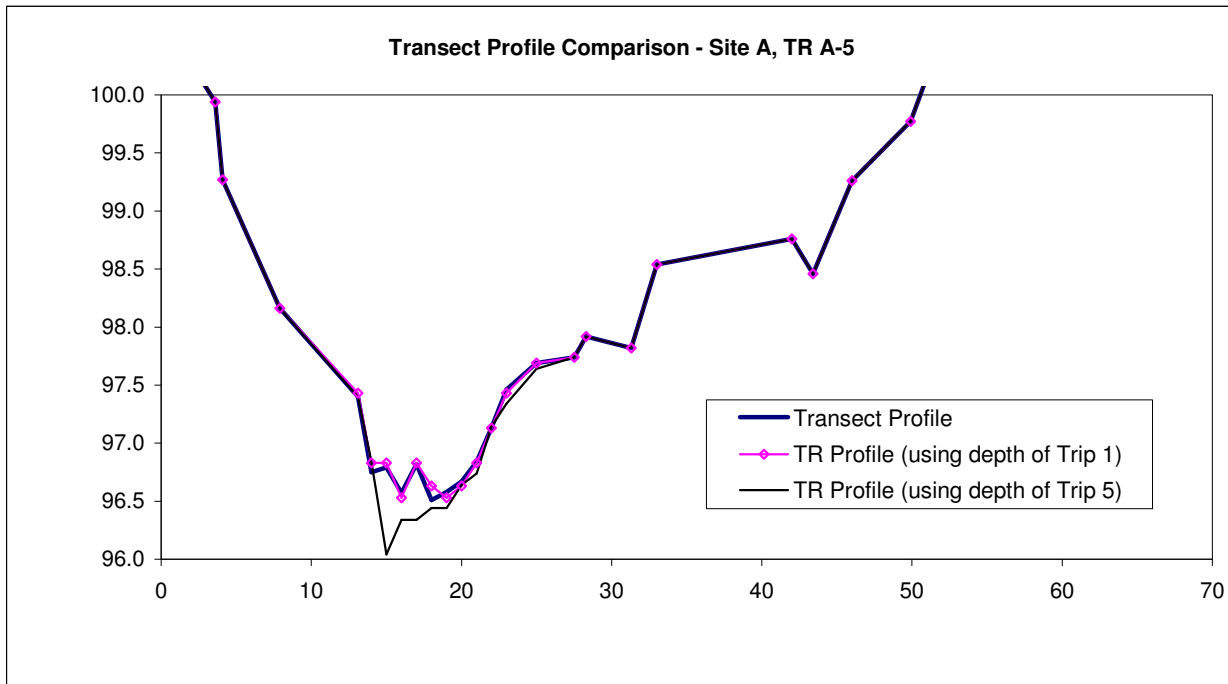


**Transect profile Comparison - Site A, TR A-5**

Sta (ft)	HI (ft)	FS (ft)	Trip 1				Trip 5				subs	code	
			Elev (ft)	Depth (ft)	Velocity (ft/s)	q (cfs)	Bed Elev (ft)	Depth (ft)	Velocity (ft/s)	q (cfs)			Bed Elev (ft)
0	104.6	3.92	100.68				100.68				org	0	
3.6	104.6	4.66	99.94				99.94				org	0	
4.1	104.6	5.33	99.27				99.27				org	0	
7.9	104.6	6.44	98.16				98.16				org	0	
13.1	104.6	7.2	97.4	0	0	0.00	97.43				org	0	
14	104.6	7.85	96.75	0.6	0.0	0.00	96.83	0.8	0	0.00	96.84	bed	8
15	104.6	7.81	96.79	0.6	2.3	1.38	96.83	1.6	0.9	1.44	96.04	bed	8
16	104.6	8.03	96.57	0.9	2.7	2.43	96.53	1.3	2.7	3.51	96.34	90	5
17	104.6	7.78	96.82	0.6	2.0	1.20	96.83	1.3	2.7	3.51	96.34	64	4
18	104.6	8.09	96.51	0.8	1.8	1.44	96.63	1.2	2.8	3.36	96.44	45	4
19	104.6	8.02	96.58	0.9	1.8	1.62	96.53	1.2	2.8	3.36	96.44	32	3
20	104.6	7.93	96.67	0.8	1.9	1.52	96.63	1	2.4	2.40	96.64	32	3
21	104.6	7.76	96.84	0.6	1.5	0.90	96.83	0.9	1.8	1.62	96.74	23	3
22	104.6	7.47	97.13	0.3	0.9	0.27	97.13	0.5	1.4	0.70	97.14	16	3
23	104.6	7.14	97.46	0.0	0.0	0.00	97.43	0.3	0.7	0.32	97.34	16	3
25	104.6	6.91	97.69				97.69	0	0	0.00	97.64	11	3
27.5	104.6	6.86	97.74				97.74				97.74	org	0
28.3	104.6	6.68	97.92				97.92				97.92	org	0
31.3	104.6	6.78	97.82				97.82				97.82	org	0
33	104.6	6.06	98.54				98.54				98.54	org	0
42	104.6	5.84	98.76				98.76				98.76	512	7
43.4	104.6	6.14	98.46				98.46				98.46	32	3
46	104.6	5.34	99.26				99.26				99.26	1024	7
49.9	104.6	4.83	99.77				99.77				99.77	org	0
58.3	104.6	1.87	102.73				102.73				102.73	32	3
60.8	104.6	1.28	103.32				103.32				103.32	6	2

TR Q (cfs)= 10.8

TR Q (cfs)= 20.2



**Reach:** Stetson Reach  
**Stream:** Cooper Lake  
**Site:** Site A  
**Habitat Type:** Riffle

**(1) Field Data**

- (a) Field data were collected in five trips from 5/2003 to 5/2004.
- (b) Flow data were only collected in Trip 1 on 5/15/2003 and in Trip 5 on 5/4/2004.
- (c) WSE data were collected in all five trips.
- (d) Because no flows were measured in Trip 2 to Trip 4, flows of these three trips were estimated.  
 The estimated flows and the measured WSE and flows are plotted together in worksheet "Measured hydraulics".  
 The graphs showed WSE vs flow relationships are inconsistent, indicating errors in estimated flows and/or surveyed WSEs.

**(2) WSE Calibration**

**WSE:** Average WSE is used as the representative transect WSE.

**Discharge:** Trip 1 Q = Average discharge of TR A-1 and TR A-3. TR A-2, TR A-4, and TR A-5 were considered as outliers.  
 Trip 5 Q = Average discharge of TR A-1, TR A-2, and TR A-3. TR A-4 and TR A-5 were considered as outliers.

**Slope:** Use Trip 5's average WSE slope (from TR A-1 to TR A-5) = 1.05%

**SZF:**

TR	channel Invert (ft)		SZF (ft)
	Trip 1	Trip 5	
A-1	98.27	98.13	98.27
A-2	97.82	97.91	98.27
A-3	98.67	98.43	98.67
A-4	97.35	97.31	98.67
A-5	98.25	98.46	98.67

Note: Invert is the lowest elevation of the transect.  
 SZF of upstream transect must be equal or greater than the SZF of downstream transect.

**Level Loop and Headpins:**

Date	Trip	BM-A	BM-B
5/10/2003	1	100.00	97.81
6/25/2003	2		97.81
9/19/2003	3		97.81
10/10/2003	4	100.00	97.82
5/6/2004	5		97.81

- (b.1) There were no level loop surveys performed in 6/25/03, 9/19/03, and 5/6/04 trips, and BM-B elevation from the previous survey was used for WSE calculation.
- (b.2) To ensure the accuracy of WSE survey, it is recommended a headpin installed for each transect when setting up the transects and a complete level loop be performed during each site visit.  
 A recommended complete level loop would include moving the level for a distance to a new location after all HP/BM are surveyed. Then reshoot *all* pins to check if pin elevations are consistent.
- (c) Control pins between 5/03 and 10/03 should be stable, but it is not able to determine if the pins were still stable in Trip 5.

**Calibration Flow:**

This site has five sets of measured WSEs and two sets of velocity-depth surveys. However, the data showed inconsistent flow-WSE relationship (see plots in worksheet "Measured hydraulics".) Due to inconsistent flow ~ WSE relationship, it was decided to only use flows taken in Trip 1 and Trip 5 for calibration. Estimated flows and measured WSEs of Trip 2 to Trip 4 will be not be included for calibration, and are used for comparison only

**WSE Calibration Method:**

- (1) MANSQ was used to calibrate WSE for TR A-1.
- (2) WSP was selected to calibrate WSEs for TR A-2 to TR A-5. MANSQ results of TR A-1 was used as the boundary condition for WSP.
- (3) MANSQ was applied to the lowest two simulation flows for TR A-4 and TR A-5, due to numerical convergence issues at these two flows.

**WSE Calibration Result:**

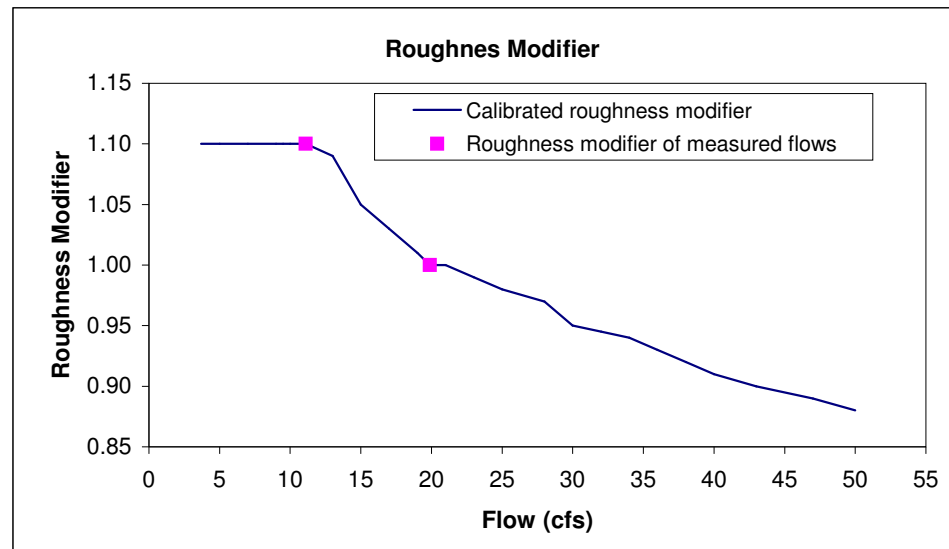
Trip	Survey Date	Q (cfs)	Modeling WSE(ft)					Calibrated WSE(ft)					ΔWSE (ft, measured-calib.)				
			TR-1	TR-2	TR-3	TR-4	TR-5	TR-1	TR-2	TR-3	TR-4	TR-5	TR-1	TR-2	TR-3	TR-4	TR-5
1	5/10/2003	11.1	95.60	96.20	96.53	97.23	97.43	95.58	96.25	96.57	97.15	97.41	0.02	-0.05	-0.04	0.08	0.02
2	6/25/2003	9.5	95.44	96.01	96.28	97.06	97.12	95.56	96.19	96.51	97.10	97.36					
3	9/19/2003	3.7	95.35	95.91	96.17	96.96	97.03	95.41	95.91	96.23	96.92	97.02					
4	10/10/2003	9.0	95.54	96.13	96.47	97.15	97.23	95.55	96.17	96.49	97.08	97.34					
5	5/6/2004	19.9	95.72	96.47	96.81	97.29	97.64	95.72	96.47	96.79	97.36	97.63	0.00	0.00	0.02	-0.07	0.01

Note: (a) WSEs of Trip 2 to Trip 4 are listed in the table only for comparison, not for calibration error calculation.

**WSP Roughness Modifier**

Flow	RAF
3.7	1.10
5	1.10
7	1.10
9	1.10
9.5	1.10
10	1.10
11.1	1.10
13.0	1.09
15	1.05
17	1.03
19	1.01
19.9	1.00
21	1.00
23	0.99
25	0.98
28.0	0.97
30	0.95
32	0.94
34	0.94
36	0.93
38	0.92

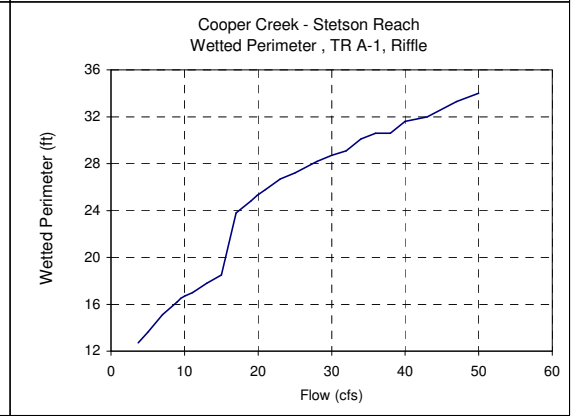
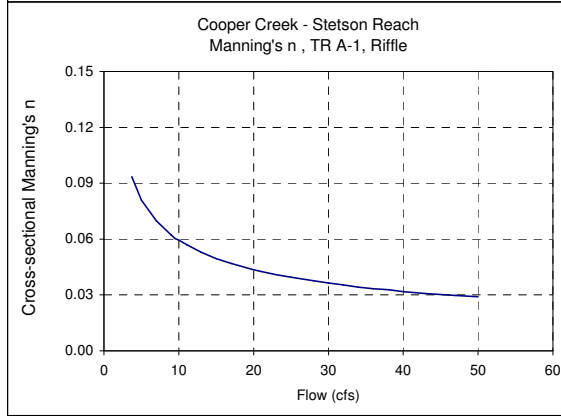
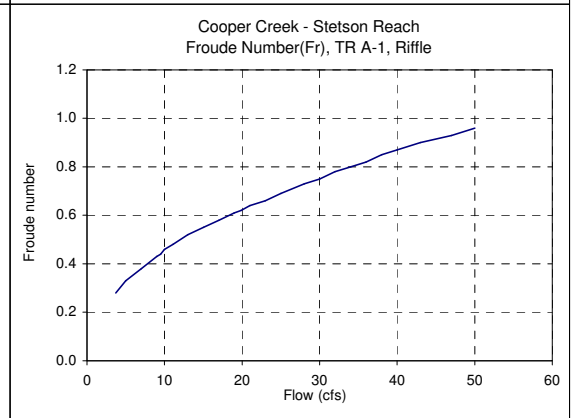
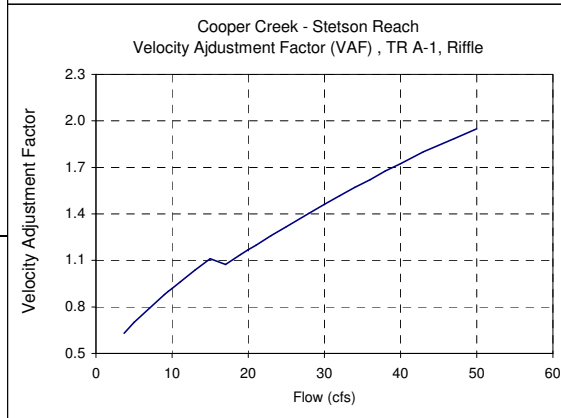
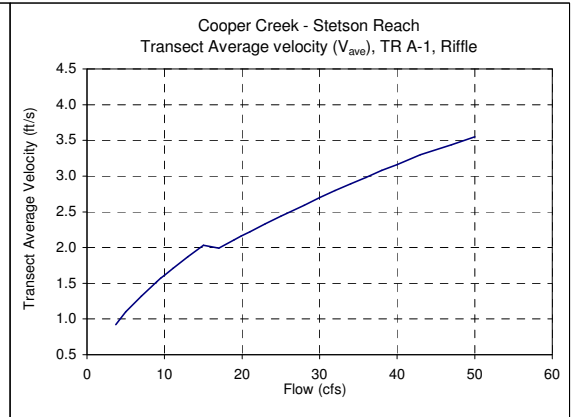
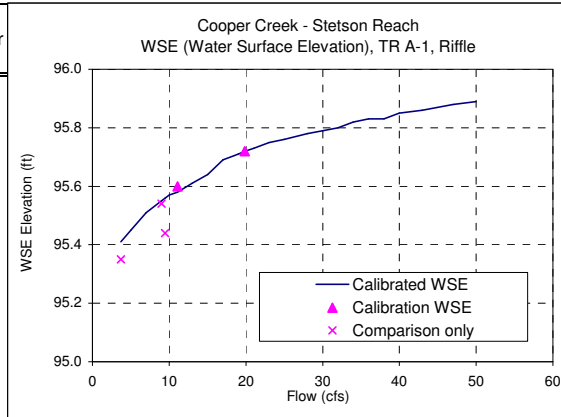
(\*) The table on the left lists the Roughness Modifier used in the WSP WSE calibration.





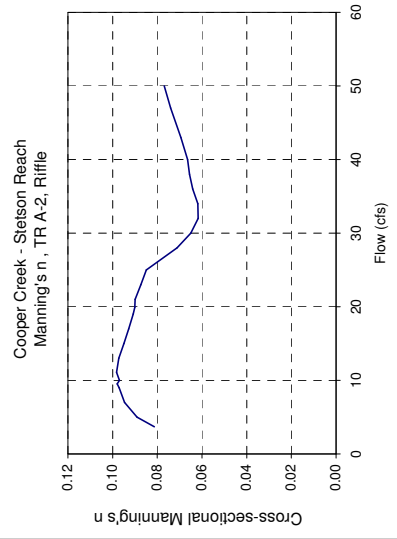
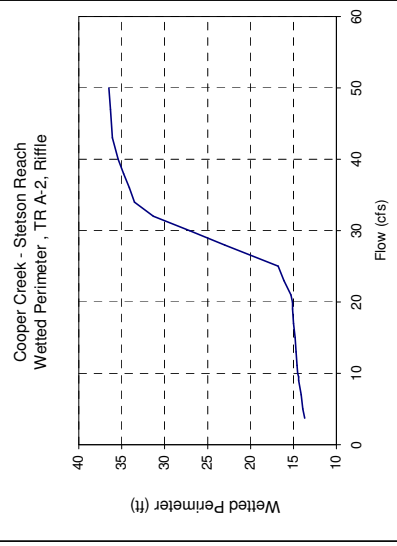
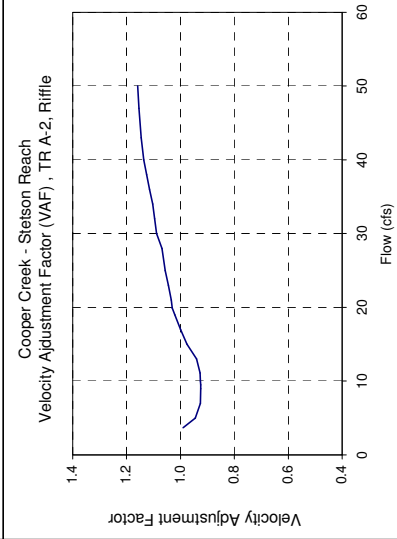
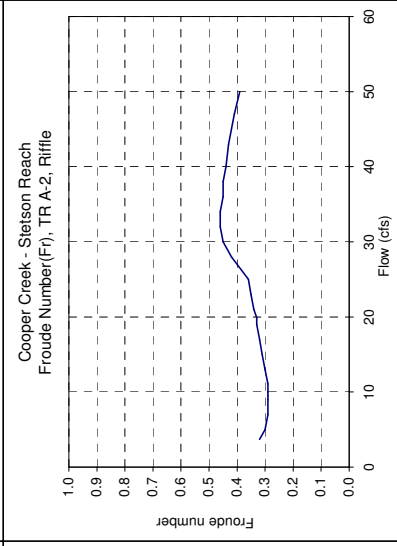
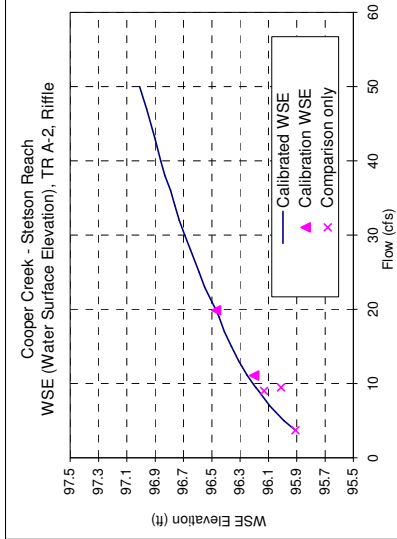
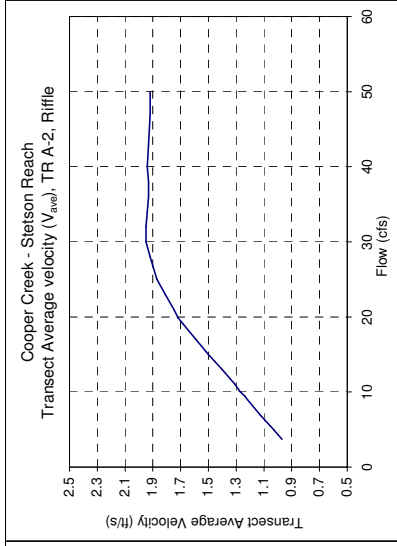
Reach **Stetson Reach**  
 Stream: **Cooper Lake**  
 Transect : **A-1**  
 Habitat: **Riffle**

Modeling		Simul. Q (cfs)	Cal'd WSE (ft)	VAF	Froude Number	Velocity (ft/s)	Manning's n	wettered perimeter (ft)
Q (cfs)	WSE (ft)							
11.1	95.60	3.7	95.41	0.63	0.28	0.92	0.093	12.7
9.5	95.44	5	95.45	0.70	0.33	1.10	0.081	13.6
3.7	95.35	7	95.51	0.79	0.38	1.32	0.070	15.1
9.0	95.54	9	95.55	0.88	0.43	1.52	0.062	16.2
19.9	95.72	9.5	95.56	0.90	0.44	1.57	0.060	16.5
		10	95.57	0.92	0.46	1.61	0.059	16.7
		11.1	95.58	0.96	0.48	1.71	0.057	17
		13	95.61	1.04	0.52	1.87	0.053	17.8
		15	95.64	1.11	0.55	2.03	0.049	18.5
		17	95.69	1.07	0.58	1.99	0.047	23.8
		19	95.71	1.14	0.61	2.11	0.045	24.8
		19.9	95.72	1.17	0.62	2.16	0.044	25.3
		21	95.73	1.20	0.64	2.22	0.043	25.8
		23	95.75	1.26	0.66	2.33	0.041	26.7
		25	95.76	1.32	0.69	2.44	0.040	27.2
		28	95.78	1.40	0.73	2.59	0.038	28.2
		30	95.79	1.46	0.75	2.70	0.036	28.7
		32	95.80	1.52	0.78	2.80	0.035	29.1
		34	95.82	1.57	0.80	2.89	0.034	30.1
		36	95.83	1.62	0.82	2.98	0.033	30.6
		38	95.83	1.68	0.85	3.08	0.033	30.6
		40	95.85	1.72	0.87	3.16	0.032	31.6
		43	95.86	1.80	0.90	3.30	0.031	32
		47	95.88	1.89	0.93	3.44	0.030	33.3
		50	95.89	1.95	0.96	3.55	0.029	34



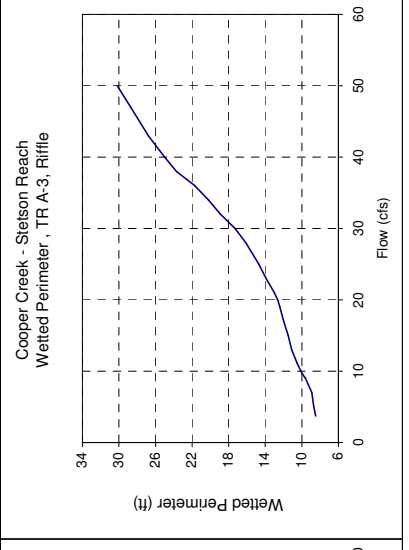
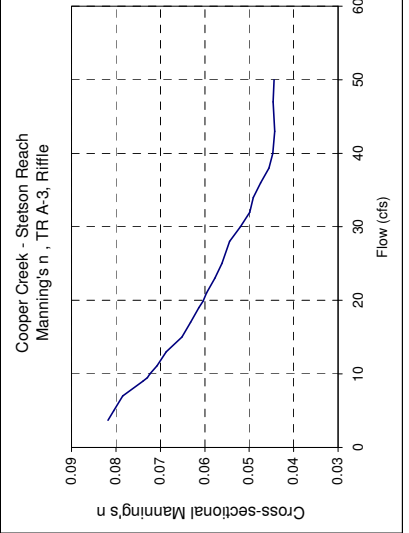
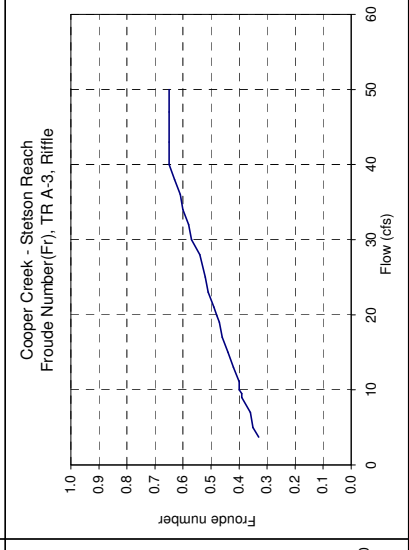
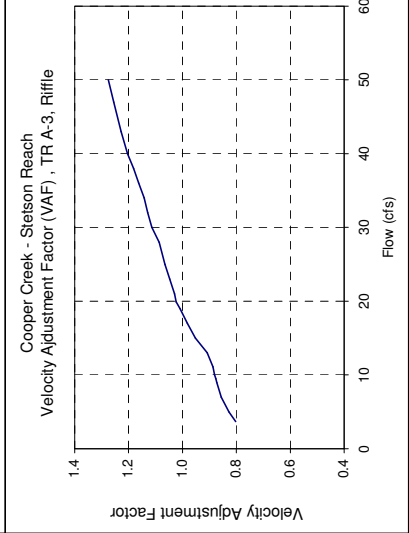
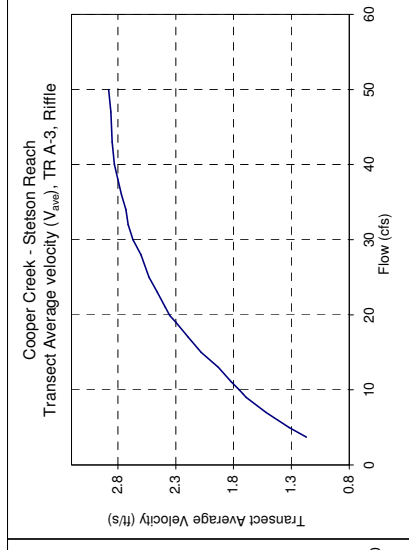
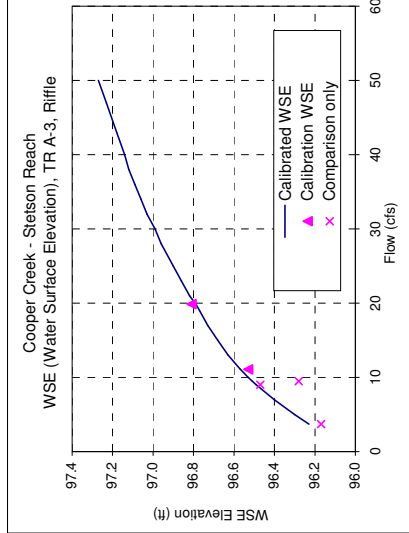
Reach: Stetson Reach  
 Stream: Cooper Lake  
 Transect: A-2  
 Habitat: Riffle

Modeling Q (cfs)	WSE (ft)	Simul. Q (cfs)	Cal'd WSE (ft)	VAF	Froude Number	Velocity (ft/s)	Manning's n	wetted perimeter (ft)
11.1	96.20	3.7	95.91	0.99	0.32	0.97	0.081	13.7
9.5	96.01	5	95.99	0.95	0.30	1.03	0.089	13.9
3.7	95.91	7	96.09	0.93	0.29	1.13	0.095	14.1
9.0	96.13	9	96.17	0.93	0.29	1.22	0.097	14.4
19.9	96.47	9.5	96.19	0.93	0.29	1.24	0.098	14.4
		10	96.21	0.93	0.29	1.27	0.097	14.5
		11.1	96.25	0.93	0.29	1.31	0.098	14.6
		13	96.31	0.94	0.30	1.40	0.097	14.7
		15	96.36	0.98	0.31	1.50	0.095	14.8
		17	96.41	1.00	0.32	1.59	0.093	15
		19	96.45	1.02	0.33	1.68	0.091	15.1
		19.9	96.47	1.03	0.33	1.72	0.090	15.1
		21	96.50	1.03	0.34	1.75	0.090	15.3
		23	96.55	1.04	0.35	1.81	0.087	16.1
		25	96.59	1.06	0.36	1.87	0.085	16.8
		28	96.65	1.07	0.42	1.92	0.071	23
		30	96.69	1.09	0.45	1.95	0.065	27.1
		32	96.73	1.10	0.46	1.95	0.062	31.3
		34	96.76	1.10	0.46	1.94	0.062	33.5
		36	96.79	1.12	0.45	1.93	0.064	34.1
		38	96.83	1.13	0.45	1.93	0.066	34.8
		40	96.86	1.14	0.44	1.94	0.067	35.4
		43	96.90	1.15	0.43	1.93	0.069	36.1
		47	96.96	1.15	0.41	1.92	0.074	36.3
		50	97.01	1.16	0.39	1.92	0.077	36.5



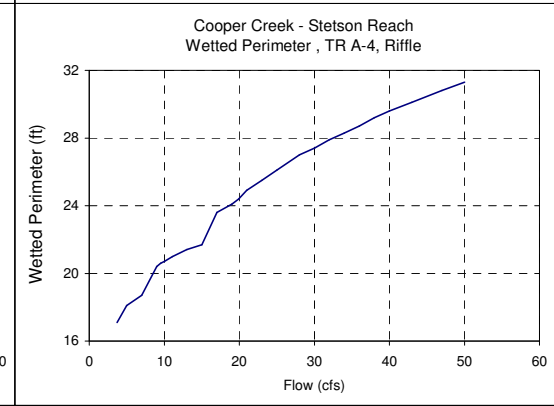
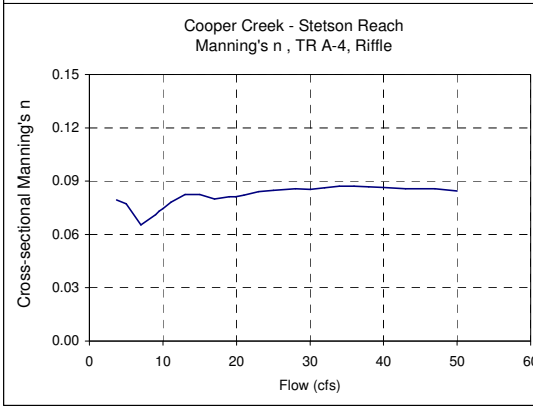
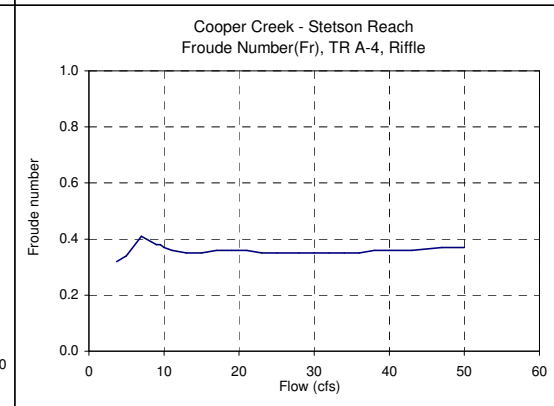
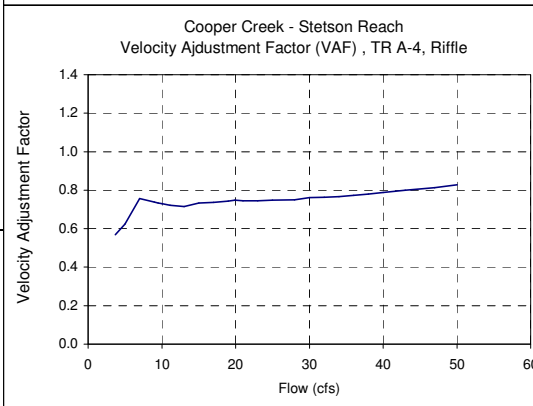
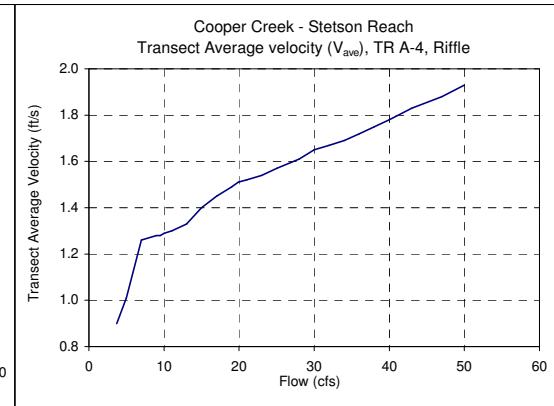
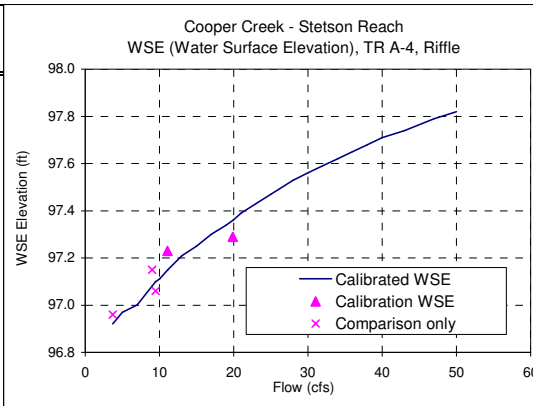
**Reach** Stetson Reach  
**Stream** Cooper Lake  
**Transect** A-3  
**Habitat** Riffle

Q (cfs)	Modeling		Simul. Q (cfs)	Cal'd WSE (ft)	VAF	Froude Number	Velocity (ft/s)	Manning's n	wetted perimeter (ft)
	Q (cfs)	WSE (ft)							
11.1	96.53		3.7	96.23	0.80	0.33	1.17	0.082	8.5
9.5	96.28		5	96.30	0.83	0.35	1.32	0.081	8.7
3.7	96.17		7	96.40	0.86	0.36	1.52	0.078	8.9
9.0	96.47		9	96.49	0.87	0.39	1.69	0.074	9.6
19.9	96.81		9.5	96.51	0.88	0.39	1.72	0.073	9.9
			10	96.53	0.88	0.40	1.75	0.072	10.1
			11.1	96.57	0.89	0.40	1.82	0.071	10.5
			13	96.63	0.91	0.42	1.93	0.069	11.1
			15	96.68	0.95	0.44	2.08	0.065	11.5
			17	96.73	0.98	0.46	2.19	0.063	12
			19	96.77	1.01	0.47	2.30	0.061	12.4
			19.9	96.79	1.02	0.48	2.35	0.060	12.6
			21	96.82	1.03	0.49	2.39	0.060	13
			23	96.86	1.05	0.51	2.46	0.058	13.9
			25	96.90	1.06	0.52	2.53	0.056	14.7
			28	96.96	1.09	0.54	2.60	0.054	16.1
			30	96.99	1.11	0.57	2.67	0.052	17.3
			32	97.03	1.13	0.58	2.71	0.050	18.9
			34	97.06	1.14	0.60	2.73	0.049	20.2
			36	97.09	1.16	0.61	2.77	0.047	21.7
			38	97.12	1.18	0.63	2.80	0.046	23.7
			40	97.14	1.20	0.65	2.83	0.045	25
			43	97.18	1.23	0.65	2.85	0.044	26.8
			47	97.23	1.25	0.65	2.86	0.045	28.7
			50	97.27	1.28	0.65	2.88	0.044	30.2



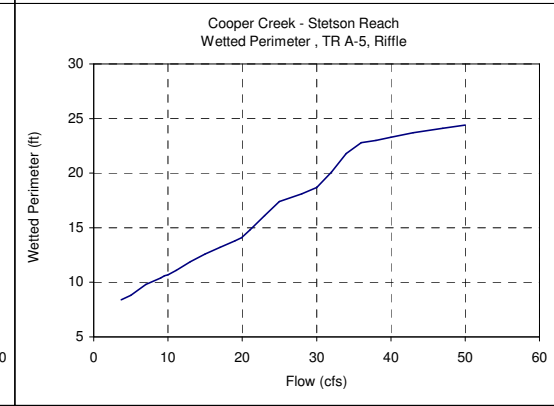
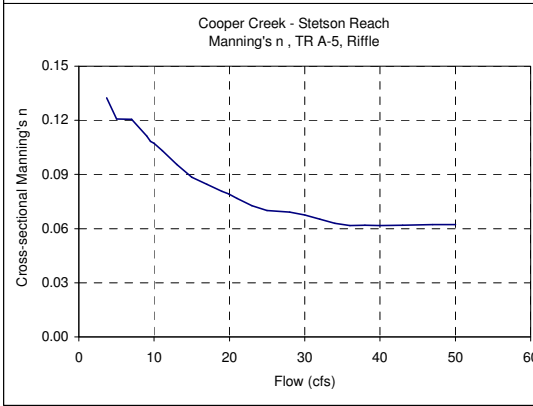
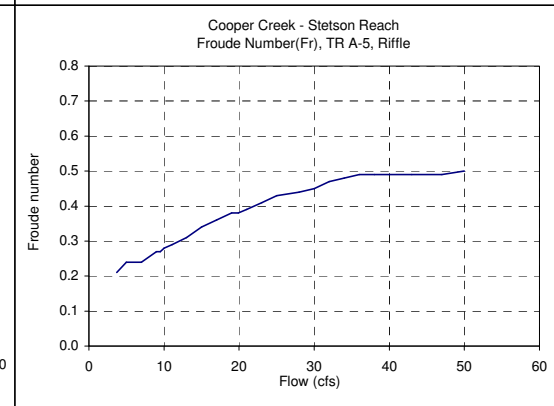
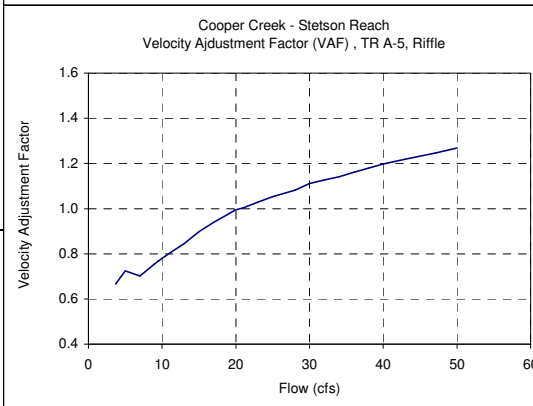
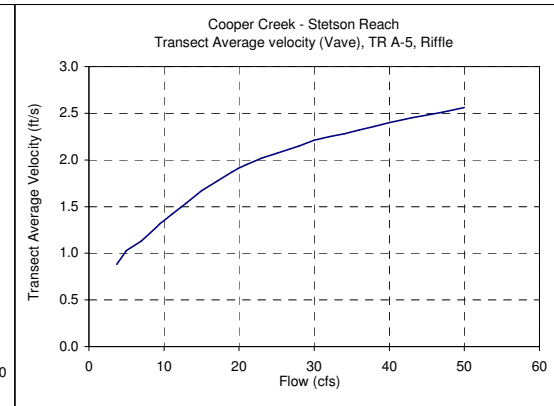
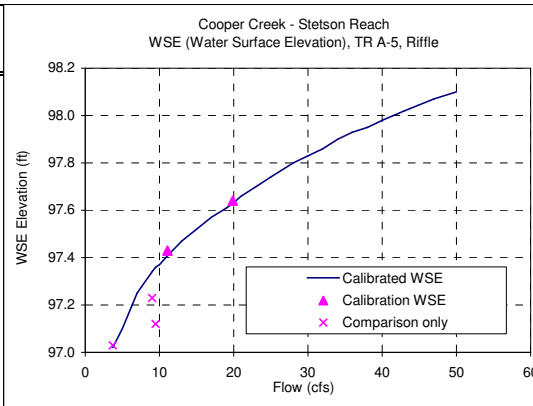
Reach: **Stetson Reach**  
 Stream: **Cooper Lake**  
 Transect: **A-4**  
 Habitat: **Riffle**

Modeling		Simul.	Cal'd					wetted
Q	WSE	Q	WSE	VAF	Froude	Velocity	Manning's	perimeter
(cfs)	(ft)	(cfs)	(ft)		Number	(ft/s)	n	(ft)
11.1	97.23	3.7	96.92	0.57	0.32	0.90	0.079	17.1
9.5	97.06	5	96.97	0.62	0.34	1.01	0.077	18.1
3.7	96.96	7	97.00	0.76	0.41	1.26	0.065	18.7
9.0	97.15	9	97.08	0.74	0.38	1.28	0.071	20.4
19.9	97.29	9.5	97.10	0.73	0.38	1.28	0.073	20.6
		10	97.11	0.73	0.37	1.29	0.075	20.7
		11.1	97.15	0.72	0.36	1.30	0.078	21
		13	97.21	0.71	0.35	1.33	0.082	21.4
		15	97.25	0.73	0.35	1.40	0.083	21.7
		17	97.30	0.74	0.36	1.45	0.080	23.6
		19	97.34	0.74	0.36	1.49	0.081	24.1
		19.9	97.36	0.75	0.36	1.51	0.081	24.4
		21	97.39	0.74	0.36	1.52	0.082	24.9
		23	97.43	0.75	0.35	1.54	0.084	25.5
		25	97.47	0.75	0.35	1.57	0.085	26.1
		28	97.53	0.75	0.35	1.61	0.086	27
		30	97.56	0.76	0.35	1.65	0.085	27.4
		32	97.59	0.76	0.35	1.67	0.086	27.9
		34	97.62	0.77	0.35	1.69	0.087	28.3
		36	97.65	0.77	0.35	1.72	0.087	28.7
		38	97.68	0.78	0.36	1.75	0.087	29.2
		40	97.71	0.79	0.36	1.78	0.086	29.6
		43	97.74	0.80	0.36	1.83	0.086	30.1
		47	97.79	0.81	0.37	1.88	0.086	30.8
		50	97.82	0.83	0.37	1.93	0.085	31.3

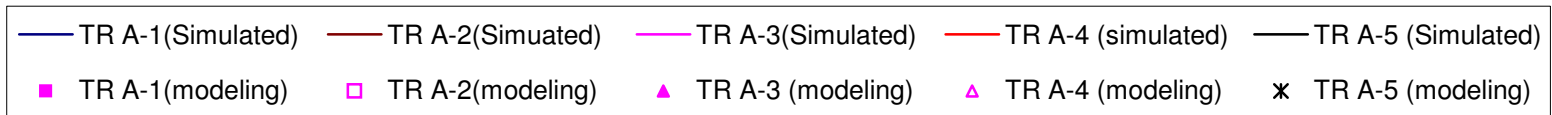
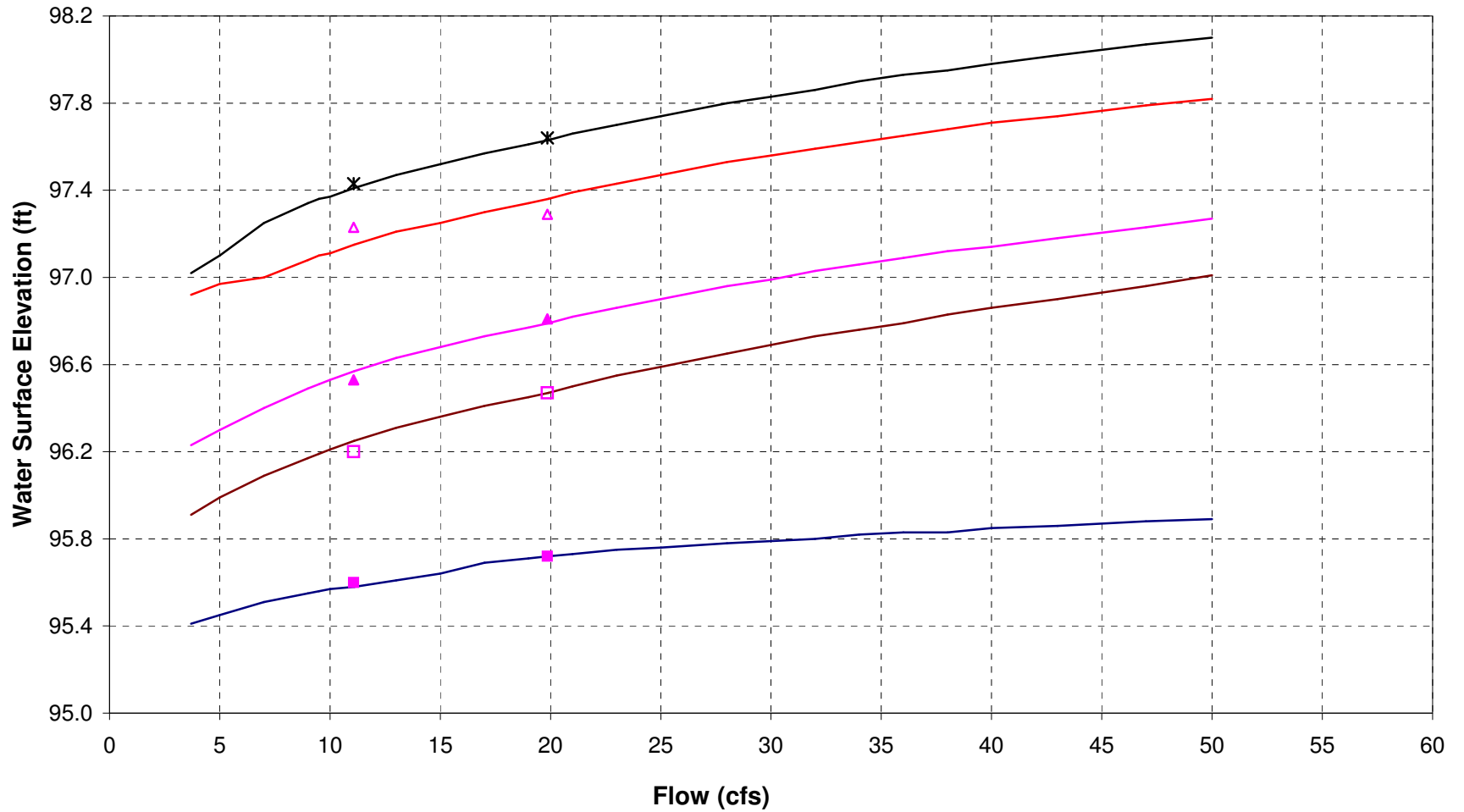


Reach: Stetson Reach  
 Stream: Cooper Lake  
 Transect: A-5  
 Habitat: Riffle

Modeling		Simul.	Cal'd					wetted
Q	WSE	Q	WSE	VAF	Froude	Velocity	Manning's	perimeter
(cfs)	(ft)	(cfs)	(ft)		Number	(ft/s)	n	(ft)
11.1	97.43	3.7	97.02	0.67	0.21	0.88	0.133	8.4
9.5	97.12	5	97.10	0.72	0.24	1.03	0.121	8.8
3.7	97.03	7	97.25	0.70	0.24	1.13	0.121	9.8
9.0	97.23	9	97.34	0.76	0.27	1.28	0.111	10.4
19.9	97.64	9.5	97.36	0.77	0.27	1.32	0.108	10.6
		10	97.37	0.78	0.28	1.35	0.107	10.7
		11.1	97.41	0.80	0.29	1.42	0.103	11.1
		13	97.47	0.84	0.31	1.54	0.096	11.9
		15	97.52	0.90	0.34	1.67	0.088	12.6
		17	97.57	0.94	0.36	1.77	0.085	13.2
		19	97.61	0.98	0.38	1.87	0.081	13.8
		19.9	97.63	0.99	0.38	1.91	0.079	14.1
		21	97.66	1.00	0.39	1.95	0.077	14.8
		23	97.70	1.03	0.41	2.02	0.073	16.1
		25	97.74	1.05	0.43	2.07	0.070	17.4
		28	97.80	1.08	0.44	2.15	0.069	18.1
		30	97.83	1.11	0.45	2.21	0.068	18.7
		32	97.86	1.13	0.47	2.25	0.065	20.1
		34	97.90	1.14	0.48	2.28	0.063	21.8
		36	97.93	1.16	0.49	2.32	0.062	22.8
		38	97.95	1.18	0.49	2.36	0.062	23
		40	97.98	1.20	0.49	2.40	0.062	23.3
		43	98.02	1.22	0.49	2.45	0.062	23.7
		47	98.07	1.25	0.49	2.51	0.062	24.1
		50	98.10	1.27	0.50	2.56	0.062	24.4

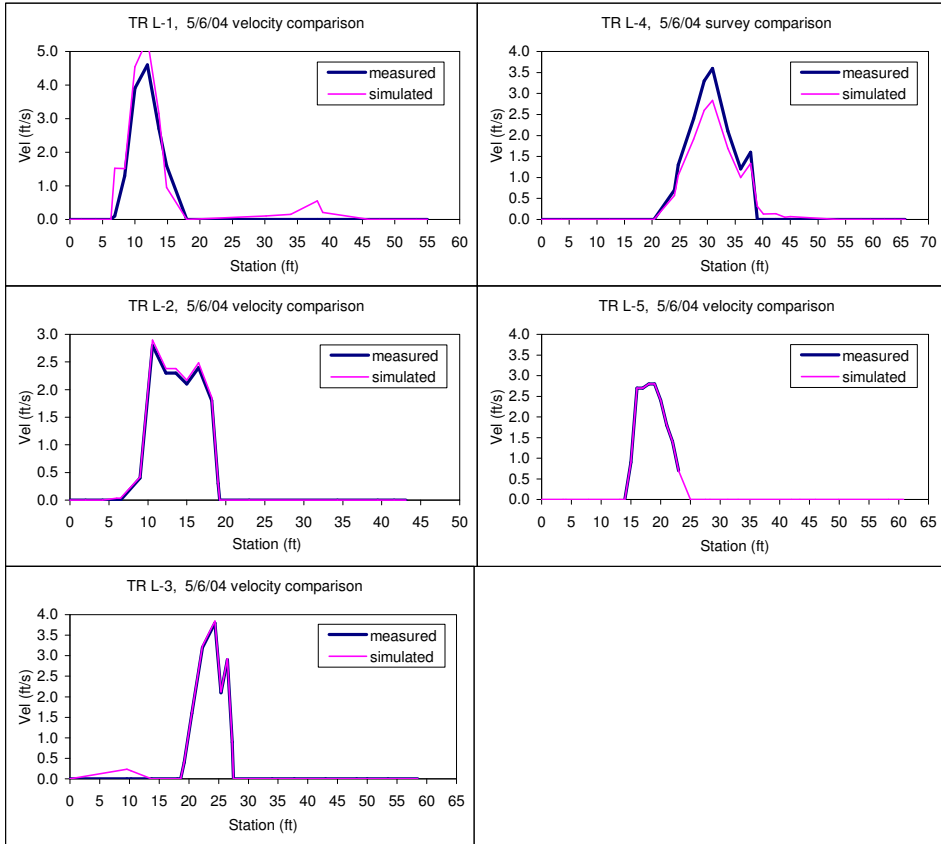


### Cooper Creek - Stetson Reach, Site A Comparison of Modeling and Simulated WSEs



Reach: **Stetson Reach**  
 Stream: **Cooper Lake**  
 Flow: **Trip 5 5/13/2003 (Q=54.5 cfs)**

Comparison of Measured and Simulated Velocity Profile



TR A-1			TR A-2			TR A-3			TR A-4			TR A-5		
Sta	meas.	simul.	Sta	meas.	simul.	Sta	meas.	simul.	Sta	meas.	simul.	Sta	meas.	simul.
0	0	0	0	0	0	0	0	0	0	0	0	0		0
1.7	0	0	2	0	0	9.6	0	0.236	3.6	0	0	3.6		0
4	0	0	4.2	0	0	10.3	0	0.193	6.7	0	0	4.1		0
6.3	0	0	6	0	0.037	13.7	0	0	12.3	0	0	7.9		0
6.9	0.1	1.524	6.5	0	0.037	18.1	0	0	20.3	0	0	13.1		0
8.4	1.3	1.516	9	0.4	0.414	18.6	0	0	24	0.7	0.572	14	0	0
10	3.9	4.547	10.6	2.8	2.898	19.2	0.4	0.403	24.7	1.3	1.048	15	0.9	0.9
11.9	4.6	5.363	12.3	2.3	2.379	20.5	1.6	1.618	27.5	2.4	1.915	16	2.7	2.7
13.7	2.7	3.148	13.6	2.3	2.378	22.3	3.2	3.239	29.4	3.3	2.597	17	2.7	2.7
14.9	1.6	0.955	15	2.1	2.172	24.4	3.8	3.842	30.9	3.6	2.833	18	2.8	2.8
18	0	0	16.5	2.4	2.483	25.4	2.1	2.12	33.7	2.1	1.693	19	2.8	2.8
30.2	0	0.109	18.2	1.8	1.861	26.5	2.9	2.928	36	1.2	1.002	20	2.4	2.4
34	0	0.149	19	0.3	0.31	27.3	0.9	0.905	37.8	1.6	1.335	21	1.8	1.8
38.1	0	0.555	19.2	0	0	27.5	0	0	39	0	0.313	22	1.4	1.4
38.9	0	0.212	23	0	0	34	0	0	40.1	0	0.13	23	0.7	0.7
46.1	0	0	34.3	0	0	37.7	0	0	42.4	0	0.134	25		0
47.7	0	0	39.5	0	0	43	0	0	44	0	0.053	27.5		0
53.3	0	0	41.6	0	0	48.2	0	0	45	0	0.071	28.3		0
55	0	0	43.1	0	0	50	0	0	53.6	0	0	31.3		0
						53.5	0	0	57.8	0	0	33		0
						58.5	0	0	59.5	0	0	42		0
									62	0	0	43.4		0
									63.9	0	0	46		0
									65.8	0	0	49.9		0
												58.3		0
												60.8		0