

APPENDIX B8: SHUTTLEWORTH CREEK

Transect Locations

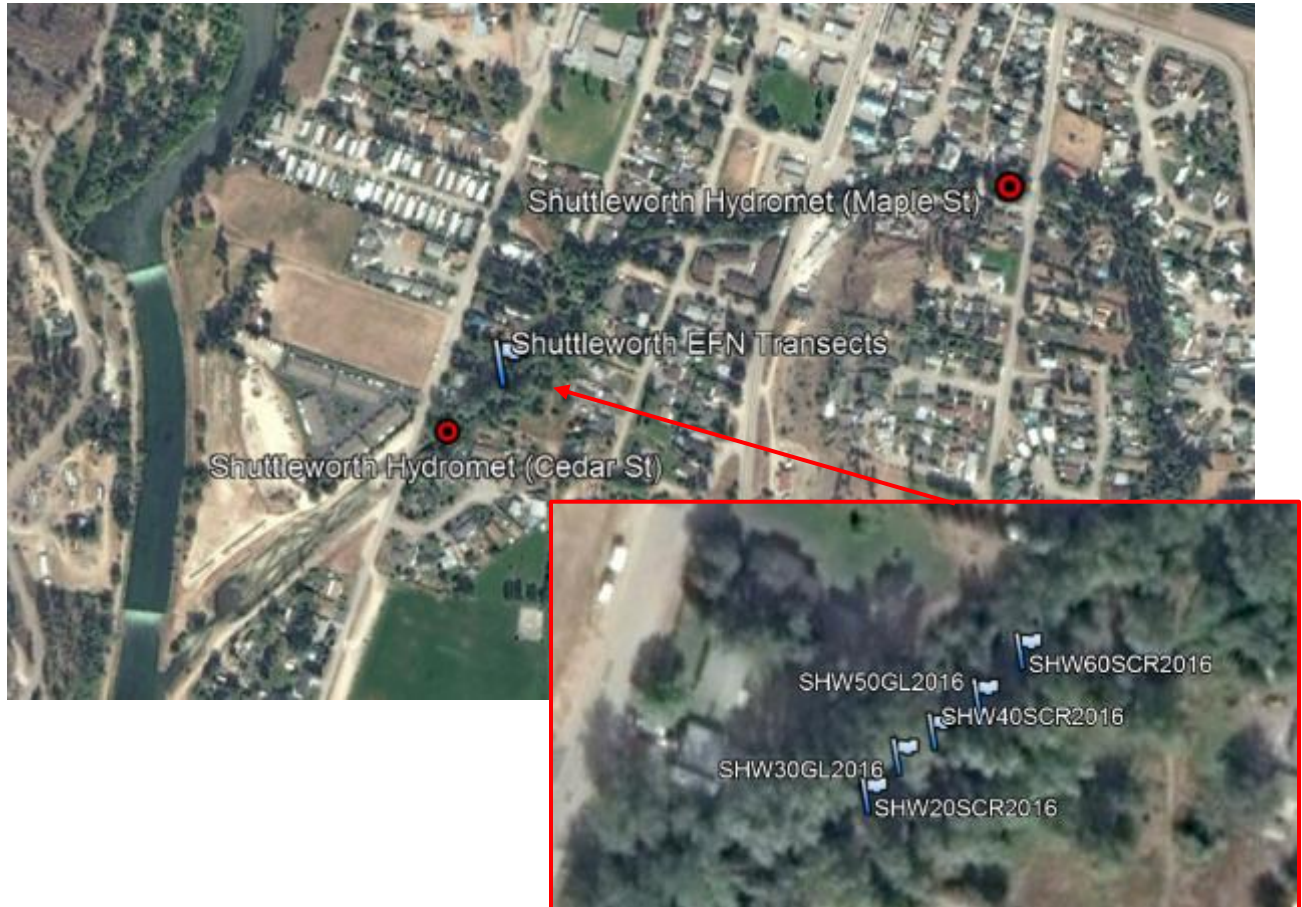


Figure B8-1: Location of EFN transects and hydrometric stations on Shuttleworth Creek, near the confluence with Okanagan River

Transect Descriptions

Transect Name SHW20SCR2016

Install Date Oct 27, 2016

Lat./Long. 49.33874, -119.57508

Width (install) 3.95 m

Depth (install) 0.17 m



Looking upstream



Looking downstream



Looking left bank to right bank

Transect Name SHW30GL2016

Install Date Oct 27, 2016

Lat./Long. 49.338827, -119.575028

Width (install) 4.10 m

Depth (install) 0.22 m



Looking upstream



Looking downstream



Looking left bank to right bank

Transect Name SHW40SCR2016

Install Date Oct 27, 2016

Lat./Long. 49.338893, -119.574951

Width (install) 4.80 m

Depth (install) 0.10 m



Looking upstream



Looking downstream



Looking left bank to right bank

Transect Name SHW50GL2016

Install Date Oct 27, 2016

Lat./Long. 49.338981, -119.574858

Width (install) 4.80 m

Depth (install) 0.16 m



Looking upstream



Looking downstream



Looking left bank to right bank

Transect Name SHW60SCR2016

Install Date Oct 27, 2016

Lat./Long. 49.339088, -119.574781

Width (install) 4.20 m

Depth (install) 0.09 m



Looking upstream



Looking downstream

Lower Shuttleworth Hydromet (Maple Street)

Install Date 2012

Latitude 49.342125

Longitude -119.569053



Downstream view from Maple Street



Staff gauge at Maple Street bridge

Discharge Records

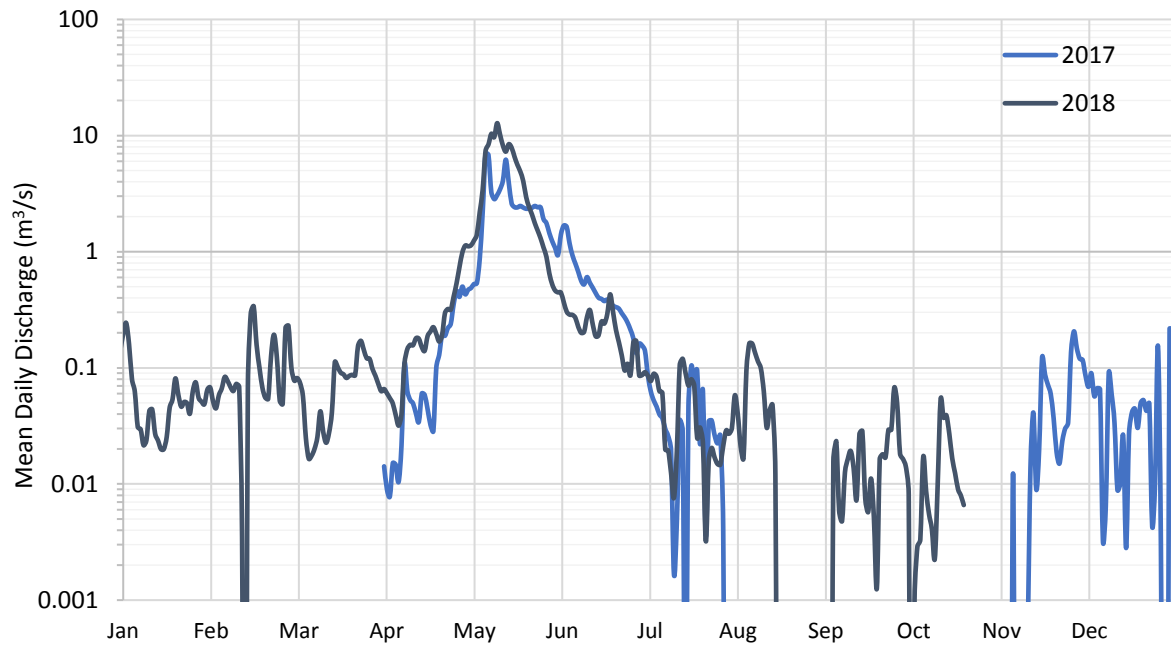


Figure B8-2: Daily mean discharge measured at the Shuttleworth Hydrometric Station (Maple Street) from 2017 to 2018

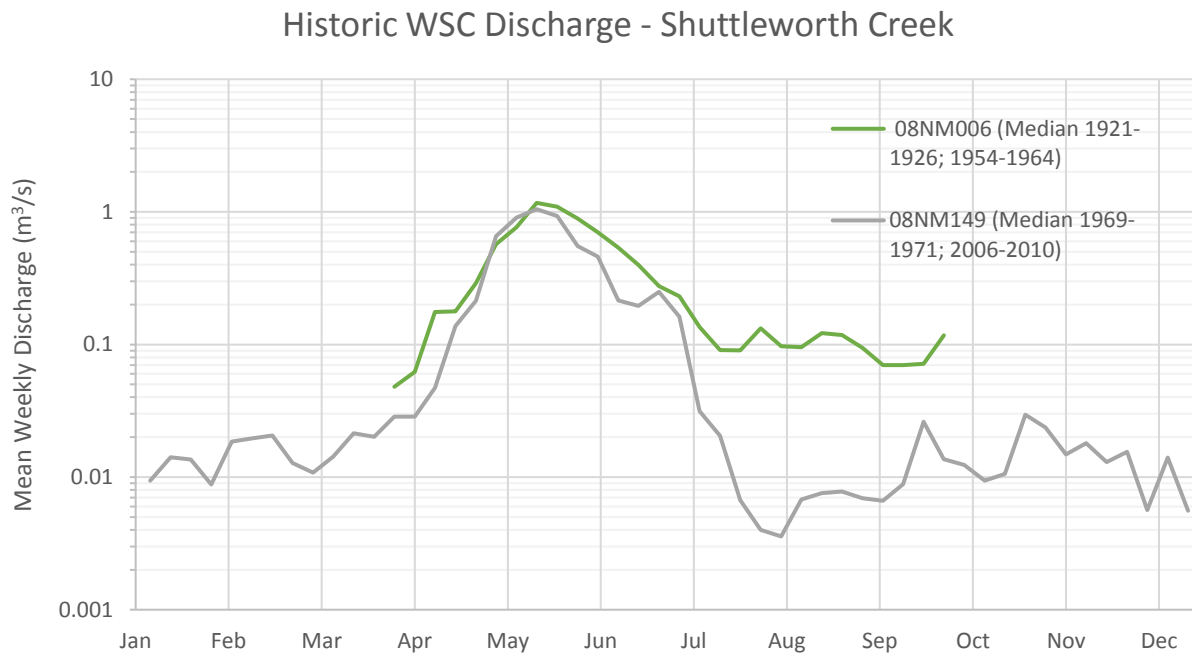


Figure B8-3: Historic discharge recorded at WSC stations 08NM006 (Shuttleworth Creek near Okanagan Falls) and 08NM149 (Shuttleworth Creek near the mouth)

Water Temperature Records



Figure B8-4: Daily maximum water temperatures recorded at the Shuttleworth Hydrometric Station (Maple Street) from 2017 to 2018

Flow standards and periodicity – Okanagan Tennant analysis for Shuttleworth Creek

Week Ending	Life Stage / Week	Rainbow						Steelhead					
		Adult migration	Spawning	Incubation	Rearing	Juvenile migration	Over-wintering	Adult migration	Spawning	Incubation	Rearing	Juvenile migration	Over-wintering
Jan							20%						20%
Feb							20%						20%
Mar							20%						20%
1-Apr	13				20%			200%	200%	20%	20%		20%
8-Apr	14				20%			200%	200%	20%	20%	50%	20%
15-Apr	15	200%			20%			200%	200%	20%	20%	50%	20%
22-Apr	16	200%			20%			200%	200%	20%	20%	50%	
29-Apr	17	200%			20%			200%	200%	20%	20%	50%	
6-May	18	200%			20%	50%		200%	200%	20%	20%	50%	
13-May	19	200%			20%	50%		200%	200%	20%	20%	50%	
20-May	20	200%	40%		20%	50%		200%	200%	20%	20%	50%	
27-May	21	200%	40%	20%	20%	50%		200%	200%	20%	20%	50%	
3-Jun	22	200%	40%	20%	20%	50%		200%	200%	20%	20%	50%	
10-Jun	23	200%	40%	20%	20%	50%		200%	200%	20%	20%	50%	
17-Jun	24	200%	40%	20%	20%	50%		200%	200%	20%	20%	50%	
24-Jun	25	200%	40%	20%	20%	50%		200%	200%	20%	20%		
1-Jul	26	200%	40%	20%	20%	50%				20%	20%		
8-Jul	27	200%	40%	20%	20%	50%				20%	20%		
15-Jul	28			20%	20%	50%					20%		
22-Jul	29			20%	20%						20%		
29-Jul	30			20%	20%						20%		
5-Aug	31				20%						20%		
12-Aug	32				20%						20%		
19-Aug	33				20%						20%		
26-Aug	34				20%						20%		
2-Sep	35				20%						20%		
9-Sep	36				20%						20%		
16-Sep	37				20%						20%		
23-Sep	38				20%						20%		
30-Sep	39				20%						20%		
7-Oct	40				20%						20%		
14-Oct	41				20%						20%		
21-Oct	42				20%						20%		
28-Oct	43				20%						20%		
Nov							20%						20%
Dec							20%						20%

Flow standards and periodicity – Okanagan Tennant analysis for Shuttleworth Creek - Continued

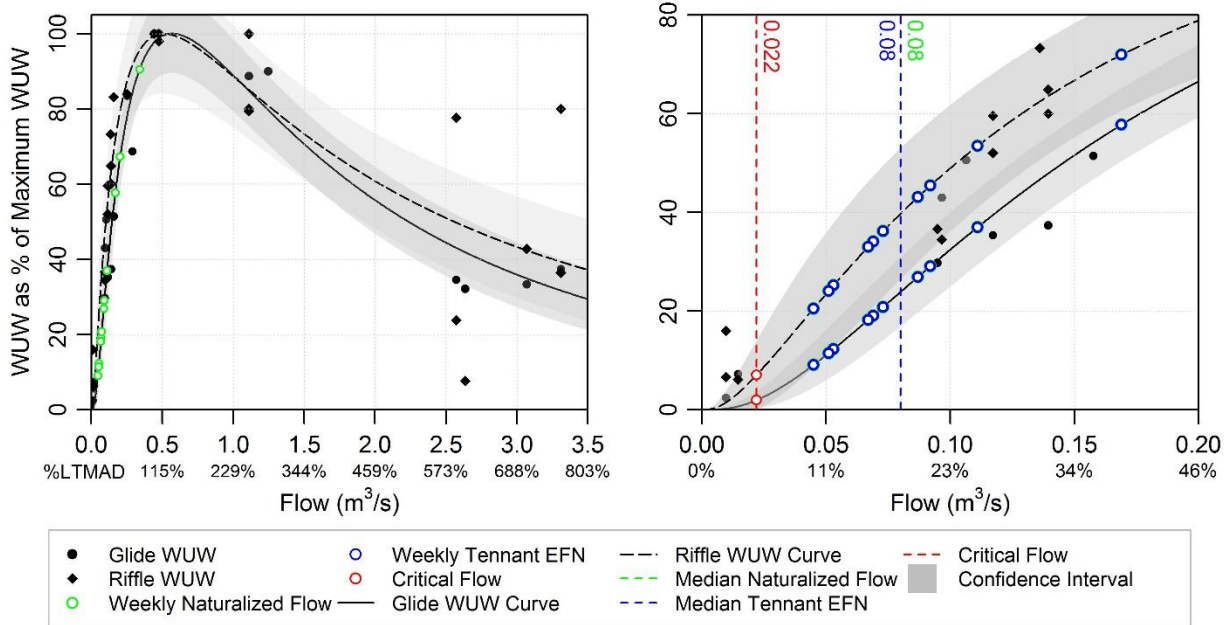
Week Ending	Life Stage/ Week	Chinook (summer) rearing	Chinook (spring)					Sockeye				Ecological Flows		
			Adult migration	Spawning	Incubation	Rearing	Juvenile migration	Over-wintering	Adult migration	Spawning	Incubation	Juvenile migration	Wetland, side channel linkage, flushing and channel maintenance flow	Cottonwood ecosystems
Jan					20%					20%				
Feb					20%					20%				
Mar		20%			20%					20%				
1-Apr	13	20%				20%						50%	<input checked="" type="checkbox"/>	
8-Apr	14	20%				20%						50%	<input checked="" type="checkbox"/>	
15-Apr	15	20%				20%	50%					50%	<input checked="" type="checkbox"/>	
22-Apr	16	20%				20%	50%					50%	<input checked="" type="checkbox"/>	
29-Apr	17	20%				20%	50%					50%	<input checked="" type="checkbox"/>	
6-May	18					20%	50%					50%	<input checked="" type="checkbox"/>	
13-May	19					20%	50%					50%	<input checked="" type="checkbox"/>	
20-May	20					20%	50%					50%	600%	
27-May	21					20%	50%						600%	
3-Jun	22					20%	50%						<input checked="" type="checkbox"/>	100%
10-Jun	23					20%	50%						<input checked="" type="checkbox"/>	100%
17-Jun	24					20%	50%						<input checked="" type="checkbox"/>	100%
24-Jun	25					20%	50%							100%
1-Jul	26		200%			20%				25%				100%
8-Jul	27		200%			20%				25%				100%
15-Jul	28		200%			20%				25%				100%
22-Jul	29		200%			20%				25%				100%
29-Jul	30		200%			20%				25%				100%
5-Aug	31		200%			20%				25%				
12-Aug	32		200%			20%				25%				
19-Aug	33		200%			20%				25%				
26-Aug	34		200%	200%	20%	20%				25%				
2-Sep	35		200%	200%	20%	20%				25%				
9-Sep	36		200%	200%	20%	20%				25%				
16-Sep	37			200%	20%	20%					40%	20%		
23-Sep	38			200%	20%	20%					40%	20%		
30-Sep	39			200%	20%	20%					40%	20%		
7-Oct	40				20%	20%					40%	20%		
14-Oct	41				20%	20%					40%	20%		
21-Oct	42				20%	20%					40%	20%		
28-Oct	43				20%	20%					40%	20%		
Nov					20%					20%				
Dec					20%					20%				

EFNs and Critical Flows for Shuttleworth Creek

Week Ending	Okanagan Tennant EFN					WUW EFN (m ³ /s)					FINAL EFN		CRITICAL FLOWS (m ³ /s)					
	EFN - all factors (%LTMAD)	EFN based on flow standards (m ³ /s)	Nat. median weekly Q (m ³ /s)	Discharge m ³ /s	%LTMAD	Rainbow rearing & insect production	Sockeye spawning	spring Chinook spawning	Steelhead spawning	Rainbow spawning	FINAL	Value (m ³ /s)	Dominant Species / Life Stage	Rainbow rearing & over wintering	Sockeye spawning	Spring Chinook spawning and migration	Rainbow/Steelhead spawning	FINAL
Jan	20%	0.087	0.035	0.035	8%							0.035	overwintering egg incubation	0.022				0.022
Feb	20%	0.087	0.032	0.032	7%							0.032	overwintering egg incubation	0.022				0.022
Mar	20%	0.087	0.043	0.043	10%							0.043	overwintering egg incubation	0.022				0.022
1-Apr	200%	0.871	0.079	0.079	18%	0.080			0.871		0.871	0.079	ST spawning	0.022			0.445	0.079
8-Apr	200%	0.871	0.120	0.120	27%	0.080			0.871		0.871	0.120	ST spawning	0.022			0.445	0.120
15-Apr	200%	0.871	0.228	0.228	52%	0.080			0.871		0.871	0.228	ST spawning	0.022			0.445	0.228
22-Apr	200%	0.871	0.456	0.456	105%	0.080			0.871		0.871	0.456	ST spawning	0.022			0.445	0.445
29-Apr	200%	0.871	1.179	0.871	200%	0.080			0.871		0.871	0.871	ST spawning	0.022			0.445	0.445
6-May	200%	0.871	1.225	0.871	200%	0.080			0.871		0.871	0.871	ST spawning	0.022			0.445	0.445
13-May	200%	0.871	1.157	0.871	200%	0.080			0.871	0.871	0.871	0.871	ST spawning	0.022			0.445	0.445
20-May	600%	2.613	2.156	2.156	495%	0.080			0.871	0.871	0.871	2.156	Ecosystem	0.022			0.445	0.445
27-May	600%	2.613	2.040	2.040	468%	0.080			0.871	0.871	0.871	2.040	Ecosystem	0.022			0.445	0.445
3-Jun	200%	0.871	1.690	0.871	200%	0.080			0.871	0.871	0.871	0.871	ST/RB spawning	0.022			0.445	0.445
10-Jun	200%	0.871	1.759	0.871	200%	0.080			0.871	0.871	0.871	0.871	ST/RB spawning	0.022			0.445	0.445
17-Jun	200%	0.871	1.393	0.871	200%	0.080			0.871	0.871	0.871	0.871	ST/RB spawning	0.022			0.445	0.445
24-Jun	200%	0.871	1.136	0.871	200%	0.080			0.871	0.871	0.871	0.871	ST/RB spawning	0.022			0.445	0.445
1-Jul	200%	0.871	0.645	0.645	148%	0.080				0.871	0.871	0.645	RB Spawning	0.022		0.087	0.445	0.445
8-Jul	200%	0.871	0.497	0.497	114%	0.080				0.871	0.871	0.497	RB Spawning	0.022		0.087	0.445	0.445
15-Jul	200%	0.871	0.340	0.340	78%	0.080					0.080	0.340	RB/ST incubation	0.022		0.087		0.087
22-Jul	200%	0.871	0.203	0.203	47%	0.080					0.080	0.203	RB/ST incubation	0.022		0.087		0.087
29-Jul	200%	0.871	0.169	0.169	39%	0.080					0.080	0.169	RB/ST incubation	0.022		0.087		0.087
5-Aug	200%	0.871	0.111	0.111	26%	0.080					0.080	0.111	CH migration	0.022		0.087		0.087
12-Aug	200%	0.871	0.092	0.092	21%	0.080					0.080	0.092	CH migration	0.022		0.087		0.087
19-Aug	200%	0.871	0.069	0.069	16%	0.080					0.080	0.069	CH migration	0.022		0.087		0.069
26-Aug	200%	0.871	0.087	0.087	20%	0.080		0.200			0.200	0.087	CH spawning	0.022		0.044		0.044
2-Sep	200%	0.871	0.073	0.073	17%	0.080		0.200			0.200	0.073	CH spawning	0.022		0.044		0.044
9-Sep	200%	0.871	0.067	0.067	15%	0.080		0.200			0.200	0.067	CH spawning	0.022		0.044		0.044
16-Sep	200%	0.871	0.045	0.045	10%	0.080	0.150	0.200			0.200	0.045	CH spawning	0.022	0.044	0.044		0.044
23-Sep	200%	0.871	0.053	0.053	12%	0.080	0.150	0.200			0.200	0.053	CH spawning	0.022	0.044	0.044		0.044
30-Sep	200%	0.871	0.051	0.051	12%	0.080	0.150	0.200			0.200	0.051	CH spawning	0.022	0.044	0.044		0.044
7-Oct	40%	0.174	0.041	0.041	9%	0.080	0.150				0.150	0.041	SK Spawning	0.022	0.044			0.044
14-Oct	40%	0.174	0.058	0.058	13%	0.080	0.150				0.150	0.058	SK Spawning	0.022	0.044			0.044
21-Oct	40%	0.174	0.070	0.070	16%	0.080	0.150				0.150	0.070	SK Spawning	0.022	0.044			0.044
28-Oct	40%	0.174	0.061	0.061	14%	0.080	0.150				0.150	0.061	SK Spawning	0.022	0.044			0.044
Nov	20%	0.087	0.081	0.081	19%							0.081	overwintering egg incubation	0.022				0.022
Dec	20%	0.087	0.044	0.044	10%							0.044	overwintering egg incubation	0.022				0.022

Weighted Usable Width

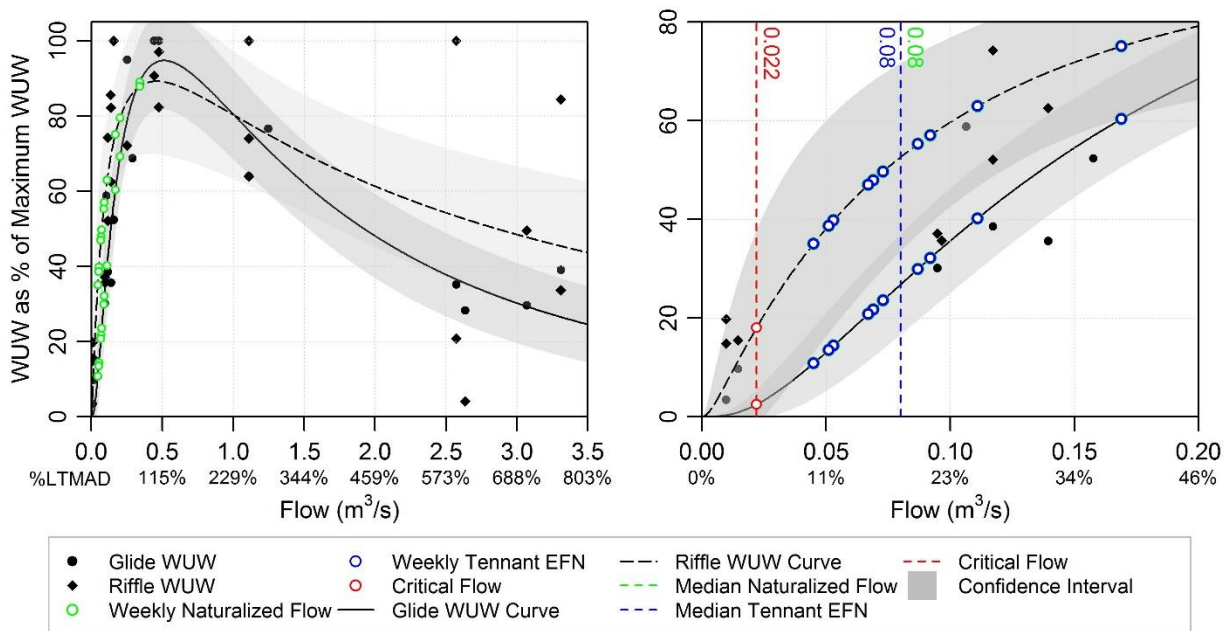
Shuttleworth Creek *O. Mykiss* Parr Rearing WUW



Median values from mid-July to end of September (week 28-39)

Figure B8-5: WUW curve for *O. Mykiss* rearing in Shuttleworth Creek for all flows (left) and low flows (right)

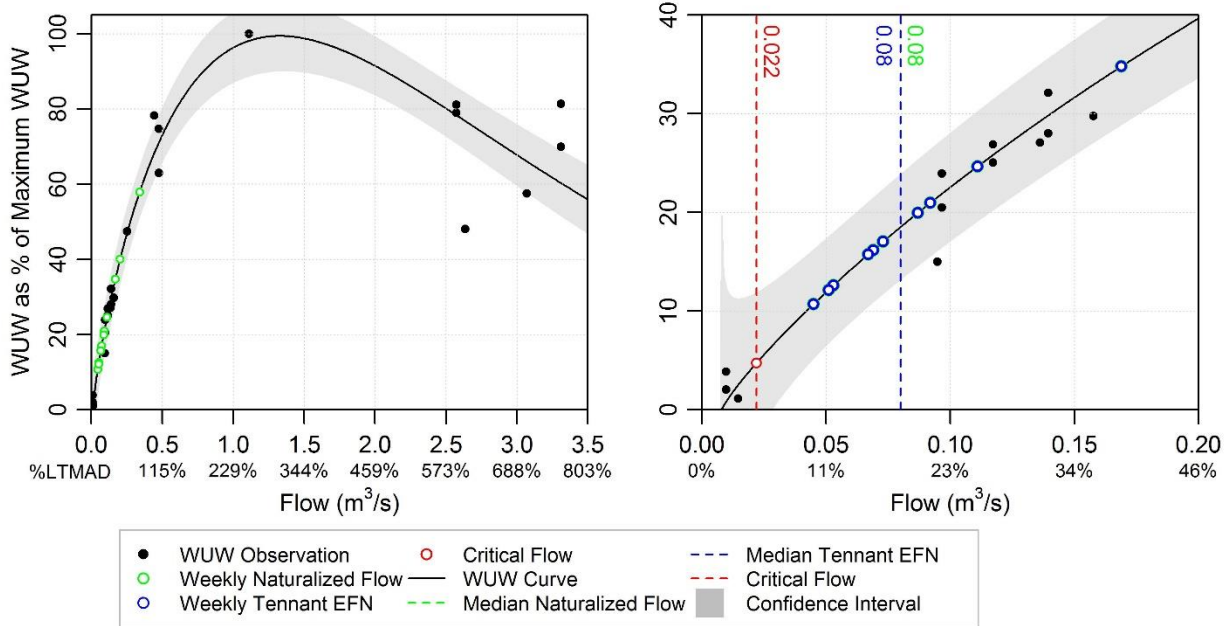
Shuttleworth Creek Chinook Fry Rearing WUW



Median values from mid-July to end of September (week 28-39)

Figure B8-6: WUW curve for Chinook fry rearing in Shuttleworth Creek for all flows (left) and low flows (right)

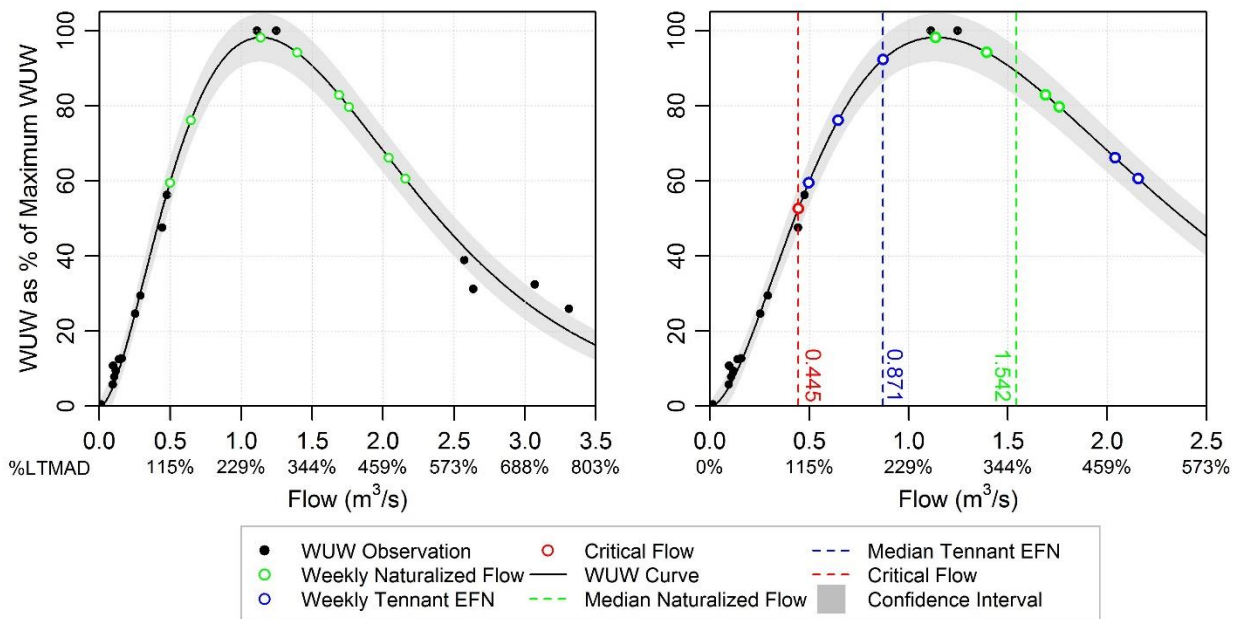
Shuttleworth Creek Insect Production WUW



Median values from mid-July to end of September (week 28-39)

Figure B8-7: WUW curve for insect production in Shuttleworth Creek for all flows (left) and low flows (right)

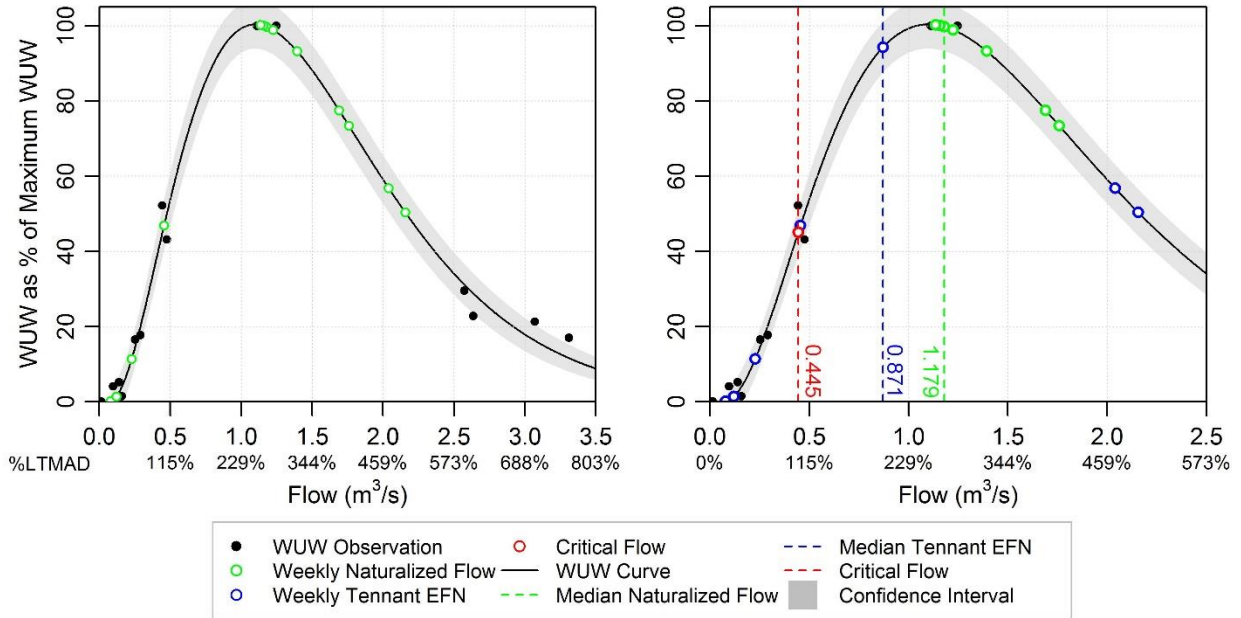
Shuttleworth Creek Rainbow Spawning WUW



Median values from May 20 to July 10 (week 20-27)

Figure B8-8: WUW curve for Rainbow spawning in Shuttleworth Creek for all flows (left) and low flows (right)

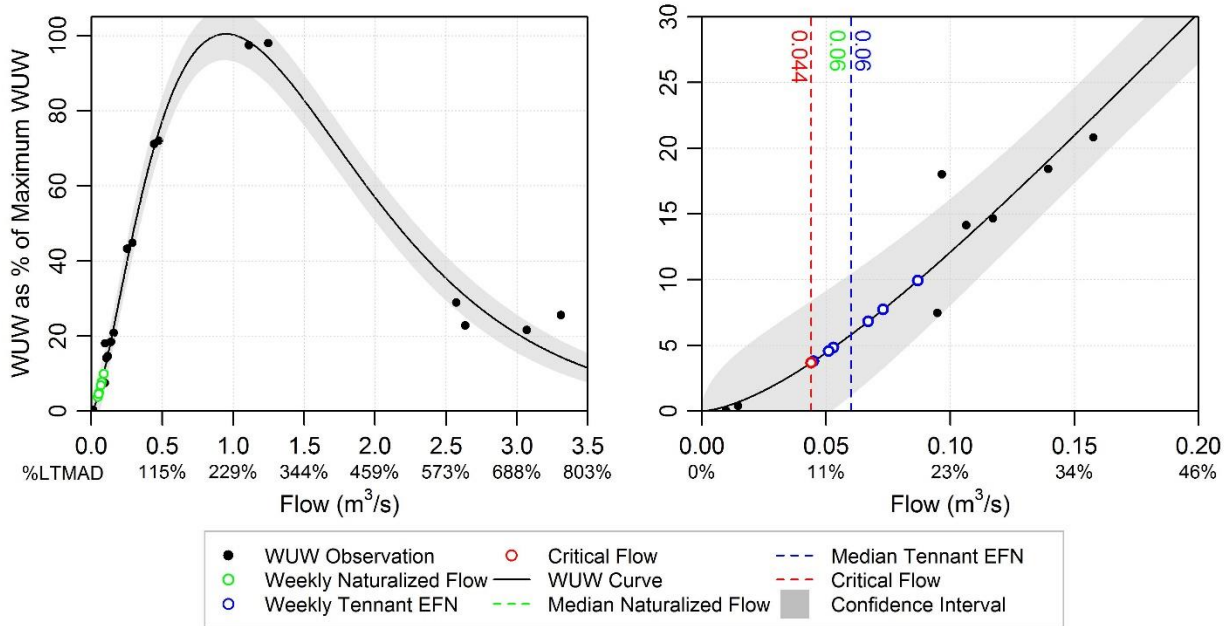
Shuttleworth Creek Steelhead Spawning WUW



Median values from April 1 to June 25 (week 13-25)

Figure B8-9: WUW curve for Steelhead spawning in Shuttleworth Creek for all flows (left) and low flows (right)

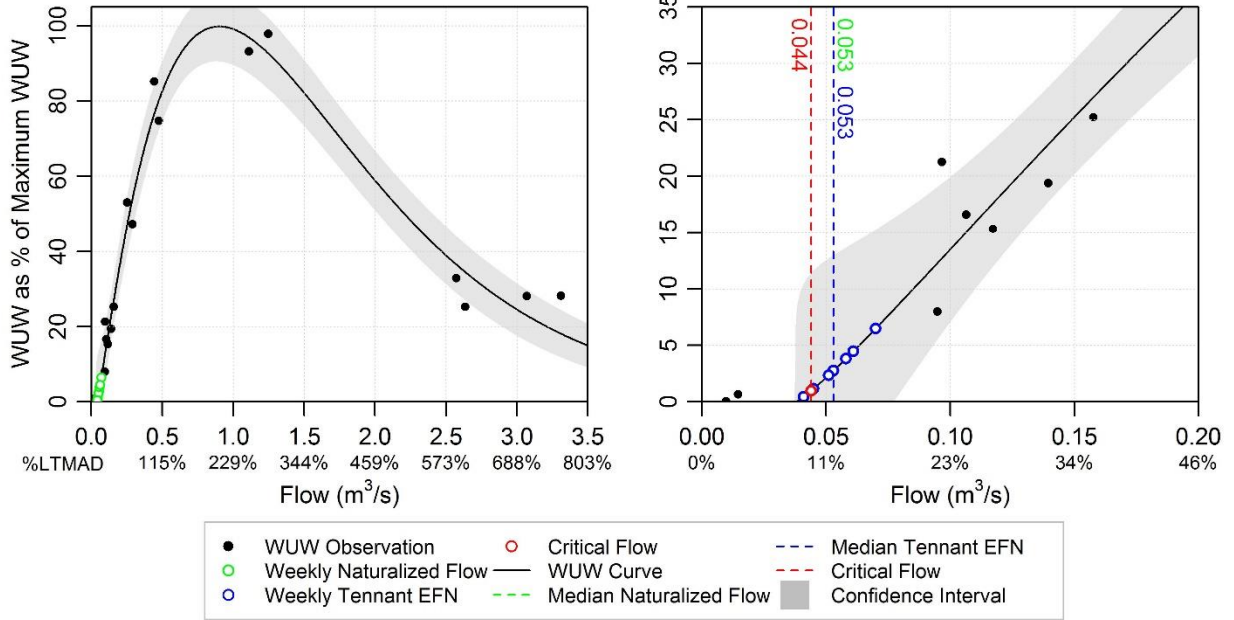
Shuttleworth Creek Chinook Spawning WUW



Median values from August 27 to September 30 (week 34-39)

Figure B8-10: WUW curve for Chinook spawning in Shuttleworth Creek for all flows (left) and low flows (right)

Shuttleworth Creek Sockeye Spawning WUW



Median values from September 16 to October 31 (week 37-43)

Figure B8-11: WUW curve for Sockeye spawning in Shuttleworth Creek for all flows (left) and low flows (right)

Critical Flows

Table B8-1: Critical flow analysis for Shuttleworth Creek

Species / Life stage	Critical Flow Criteria	SHW20SCR2016		SHW40SCR2016		SHW60SCR2016		Average	
		(m ³ /s)	% LTMAD	(m ³ /s)	% LTMAD	(m ³ /s)	% LTMAD	(m ³ /s)	% LTMAD
	Naturalized LTMAD	0.436	100%	0.436	100%	0.436	100%		
	Wetted width at 100% LTMAD (m)	4.80		5.54		5.21			
Insect production, Rainbow rearing & overwintering	60% of width at 100% LTMAD	0.010	2%	0.015	3%	0.010	2%	0.011	3%
Chinook migration & spawning	> 25% of width at 100% LTMAD is \geq 0.24m deep	0.662	152%	0.565	130%	0.606	139%	0.611	140%
Rainbow, Steelhead & Sockeye spawning	> 25% of width at 100% LTMAD is \geq 0.18m deep	0.376	86%	0.414	95%	0.547	125%	0.445	102%

Table B8-2: Final critical flows for Shuttleworth Creek

Species/Life stage	Final Critical Flow (m ³ /s)	% LTMAD	Criteria Used
Rainbow, Steelhead & Chinook rearing; insect production	0.022	5%	5% LTMAD
Rainbow & Steelhead spawning	0.445	102%	0.18m depth criterion
Chinook migration	0.087	20%	20% LTMAD
Chinook & Sockeye spawning	0.044	10%	10% LTMAD
Overwintering salmonids	0.022	5%	5% LTMAD

Table B8-3: 30 day naturalized low flows for Summer and Winter provided by Associated (2019)

	(m ³ /s)	% LTMAD
Summer (July 1 to September 30) Minimum		
Summer 1:2-year return period 30 Day Naturalized Low	0.049	11
Summer 1:5-year return period 30 Day Naturalized Low	0.020	5
Summer 1:10-year return period 30 Day Naturalized Low	0.010	2
Summer 1:20-year return period 30 Day Naturalized Low	0.006	1
Winter (November 1 to March 31) Minimum		
Winter 1:2-year return period 30 Day Naturalized Low	0.028	6
Winter 1:5-year return period 30 Day Naturalized Low	0.010	2
Winter 1:10-year return period 30 Day Naturalized Low	0.004	1
Winter 1:20-year return period 30 Day Naturalized Low	0.002	0

Percentile Flows for Shuttleworth Creek

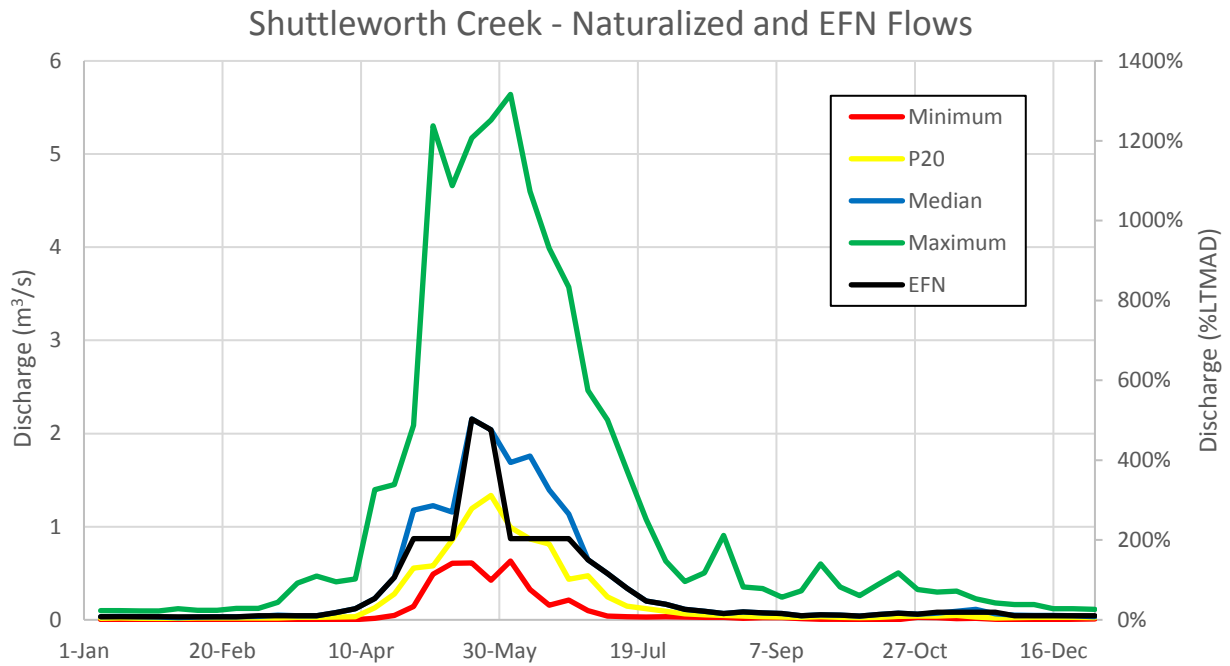


Figure B8-12: EFNs compared with naturalized flow percentiles for Shuttleworth Creek (Discharge & %LTMAD)

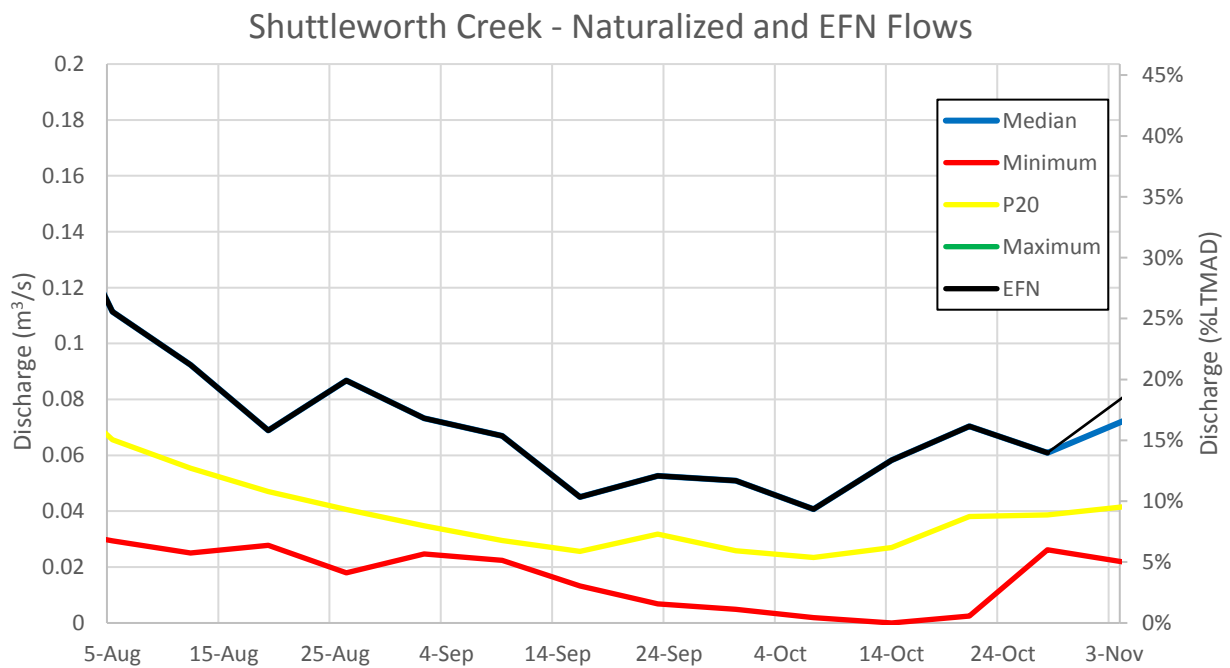


Figure B8-13: EFNs compared with naturalized flow percentiles for Shuttleworth Creek Aug-Nov (Discharge & %LTMAD)

Naturalized Percentile Flows for Shuttleworth Creek

NATURALIZED FLOW		as m ³ /s				as %LTMD			
Week	Ending	Min	P20	Median	Max	Min	P20	Median	Max
01	7-Jan	0.002	0.017	0.035	0.099	1%	4%	8%	23%
02	14-Jan	0.003	0.020	0.037	0.098	1%	5%	8%	22%
03	21-Jan	0.002	0.017	0.033	0.096	1%	4%	8%	22%
04	28-Jan	0.002	0.015	0.031	0.096	0%	4%	7%	22%
05	4-Feb	0.002	0.018	0.023	0.118	0%	4%	5%	27%
06	11-Feb	0.002	0.020	0.032	0.102	0%	4%	7%	24%
07	18-Feb	0.002	0.019	0.034	0.103	0%	4%	8%	24%
08	25-Feb	0.002	0.020	0.034	0.123	0%	5%	8%	28%
09	4-Mar	0.002	0.018	0.037	0.124	1%	4%	8%	28%
10	11-Mar	0.002	0.018	0.049	0.188	0%	4%	11%	43%
11	18-Mar	0.001	0.025	0.043	0.394	0%	6%	10%	91%
12	25-Mar	0.001	0.027	0.045	0.471	0%	6%	10%	108%
13	1-Apr	0.001	0.030	0.079	0.409	0%	7%	18%	94%
14	8-Apr	0.004	0.032	0.120	0.440	1%	7%	27%	101%
15	15-Apr	0.015	0.130	0.228	1.397	3%	30%	52%	321%
16	22-Apr	0.046	0.278	0.456	1.452	11%	64%	105%	333%
17	29-Apr	0.143	0.556	1.179	2.088	33%	128%	271%	479%
18	6-May	0.490	0.580	1.225	5.304	112%	133%	281%	1218%
19	13-May	0.607	0.858	1.157	4.661	139%	197%	266%	1070%
20	20-May	0.610	1.194	2.156	5.172	140%	274%	495%	1187%
21	27-May	0.425	1.335	2.040	5.365	98%	307%	468%	1232%
22	3-Jun	0.631	0.992	1.690	5.640	145%	228%	388%	1295%
23	10-Jun	0.325	0.867	1.759	4.600	75%	199%	404%	1056%
24	17-Jun	0.158	0.812	1.393	3.987	36%	186%	320%	915%
25	24-Jun	0.213	0.436	1.136	3.572	49%	100%	261%	820%
26	1-Jul	0.099	0.474	0.645	2.463	23%	109%	148%	565%
27	8-Jul	0.040	0.247	0.497	2.146	9%	57%	114%	493%
28	15-Jul	0.035	0.146	0.340	1.604	8%	34%	78%	368%
29	22-Jul	0.030	0.118	0.203	1.079	7%	27%	47%	248%
30	29-Jul	0.035	0.091	0.169	0.630	8%	21%	39%	145%
31	5-Aug	0.029	0.066	0.111	0.410	7%	15%	26%	94%
32	12-Aug	0.025	0.055	0.092	0.505	6%	13%	21%	116%
33	19-Aug	0.028	0.047	0.069	0.906	6%	11%	16%	208%
34	26-Aug	0.018	0.041	0.087	0.354	4%	9%	20%	81%
35	2-Sep	0.025	0.035	0.073	0.336	6%	8%	17%	77%
36	9-Sep	0.022	0.030	0.067	0.243	5%	7%	15%	56%
37	16-Sep	0.013	0.026	0.045	0.311	3%	6%	10%	71%
38	23-Sep	0.007	0.032	0.053	0.602	2%	7%	12%	138%
39	30-Sep	0.005	0.026	0.051	0.354	1%	6%	12%	81%
40	7-Oct	0.002	0.023	0.041	0.259	0%	5%	9%	59%
41	14-Oct	0.000	0.027	0.058	0.383	0%	6%	13%	88%
42	21-Oct	0.002	0.038	0.070	0.505	1%	9%	16%	116%
43	28-Oct	0.026	0.039	0.061	0.326	6%	9%	14%	75%
44	4-Nov	0.022	0.042	0.073	0.298	5%	10%	17%	68%
45	11-Nov	0.013	0.048	0.092	0.308	3%	11%	21%	71%
46	18-Nov	0.016	0.029	0.111	0.227	4%	7%	26%	52%
47	25-Nov	0.007	0.021	0.064	0.183	2%	5%	15%	42%
48	2-Dec	0.003	0.023	0.052	0.163	1%	5%	12%	37%
49	9-Dec	0.003	0.026	0.048	0.166	1%	6%	11%	38%
50	16-Dec	0.003	0.026	0.046	0.121	1%	6%	11%	28%
51	23-Dec	0.007	0.026	0.043	0.120	2%	6%	10%	28%
52	31-Dec	0.008	0.024	0.034	0.114	2%	5%	8%	26%

Residual Percentile Flows for Shuttleworth Creek

RESIDUAL FLOW		as m ³ /s				as %LTMAD			
Week	Ending	Min	P20	Median	Max	Min	P20	Median	Max
01	7-Jan	0.000	0.013	0.031	0.090	0%	3%	7%	21%
02	14-Jan	0.000	0.014	0.033	0.088	0%	3%	8%	20%
03	21-Jan	0.000	0.012	0.028	0.086	0%	3%	7%	20%
04	28-Jan	0.000	0.010	0.026	0.086	0%	2%	6%	20%
05	4-Feb	0.000	0.013	0.019	0.107	0%	3%	4%	25%
06	11-Feb	0.000	0.014	0.028	0.093	0%	3%	6%	21%
07	18-Feb	0.000	0.014	0.029	0.093	0%	3%	7%	21%
08	25-Feb	0.000	0.014	0.030	0.119	0%	3%	7%	27%
09	4-Mar	0.000	0.014	0.033	0.120	0%	3%	7%	28%
10	11-Mar	0.000	0.014	0.044	0.181	0%	3%	10%	42%
11	18-Mar	0.000	0.021	0.038	0.378	0%	5%	9%	87%
12	25-Mar	0.000	0.019	0.037	0.450	0%	4%	9%	103%
13	1-Apr	0.000	0.026	0.068	0.381	0%	6%	16%	88%
14	8-Apr	0.001	0.022	0.112	0.404	0%	5%	26%	93%
15	15-Apr	0.011	0.117	0.223	1.307	3%	27%	51%	300%
16	22-Apr	0.033	0.252	0.407	1.383	8%	58%	93%	317%
17	29-Apr	0.137	0.498	1.071	2.008	31%	114%	246%	461%
18	6-May	0.385	0.513	1.127	5.063	88%	118%	259%	1162%
19	13-May	0.558	0.741	1.119	4.462	128%	170%	257%	1024%
20	20-May	0.393	1.080	1.869	4.937	90%	248%	429%	1134%
21	27-May	0.298	1.133	1.874	5.082	68%	260%	430%	1167%
22	3-Jun	0.434	0.822	1.528	5.391	100%	189%	351%	1238%
23	10-Jun	0.181	0.714	1.621	4.370	42%	164%	372%	1003%
24	17-Jun	0.145	0.802	1.382	3.978	33%	184%	317%	913%
25	24-Jun	0.200	0.426	1.125	3.564	46%	98%	258%	818%
26	1-Jul	0.087	0.460	0.633	2.457	20%	106%	145%	564%
27	8-Jul	0.027	0.232	0.486	2.136	6%	53%	112%	490%
28	15-Jul	0.021	0.133	0.327	1.593	5%	30%	75%	366%
29	22-Jul	0.015	0.104	0.190	1.066	3%	24%	44%	245%
30	29-Jul	0.020	0.075	0.155	0.617	5%	17%	36%	142%
31	5-Aug	0.016	0.051	0.099	0.399	4%	12%	23%	92%
32	12-Aug	0.013	0.042	0.081	0.497	3%	10%	19%	114%
33	19-Aug	0.015	0.035	0.056	0.898	4%	8%	13%	206%
34	26-Aug	0.007	0.028	0.075	0.346	2%	6%	17%	80%
35	2-Sep	0.013	0.023	0.067	0.328	3%	5%	15%	75%
36	9-Sep	0.010	0.022	0.060	0.236	2%	5%	14%	54%
37	16-Sep	0.006	0.015	0.036	0.308	1%	3%	8%	71%
38	23-Sep	0.000	0.022	0.047	0.599	0%	5%	11%	137%
39	30-Sep	0.000	0.019	0.046	0.351	0%	4%	11%	81%
40	7-Oct	0.000	0.016	0.031	0.245	0%	4%	7%	56%
41	14-Oct	0.000	0.022	0.051	0.364	0%	5%	12%	84%
42	21-Oct	0.000	0.031	0.064	0.480	0%	7%	15%	110%
43	28-Oct	0.022	0.031	0.053	0.310	5%	7%	12%	71%
44	4-Nov	0.018	0.035	0.062	0.283	4%	8%	14%	65%
45	11-Nov	0.010	0.041	0.075	0.290	2%	10%	17%	67%
46	18-Nov	0.011	0.022	0.104	0.216	2%	5%	24%	50%
47	25-Nov	0.002	0.017	0.057	0.173	0%	4%	13%	40%
48	2-Dec	0.000	0.018	0.047	0.154	0%	4%	11%	35%
49	9-Dec	0.000	0.021	0.042	0.157	0%	5%	10%	36%
50	16-Dec	0.000	0.022	0.040	0.115	0%	5%	9%	26%
51	23-Dec	0.003	0.020	0.038	0.110	1%	5%	9%	25%
52	31-Dec	0.004	0.020	0.031	0.105	1%	5%	7%	24%

Maximum Licensed Percentile Flows for Shuttleworth Creek

MAX LICENSED FLOW		as m ³ /s				as %LTMAD			
Week	Ending	Min	P20	Median	Max	Min	P20	Median	Max
01	7-Jan	0.000	0.012	0.030	0.090	0%	3%	7%	21%
02	14-Jan	0.000	0.014	0.032	0.089	0%	3%	7%	20%
03	21-Jan	0.000	0.012	0.026	0.086	0%	3%	6%	20%
04	28-Jan	0.000	0.010	0.023	0.086	0%	2%	5%	20%
05	4-Feb	0.000	0.012	0.024	0.107	0%	3%	5%	25%
06	11-Feb	0.000	0.014	0.028	0.093	0%	3%	6%	21%
07	18-Feb	0.000	0.014	0.027	0.093	0%	3%	6%	21%
08	25-Feb	0.000	0.014	0.028	0.119	0%	3%	6%	27%
09	4-Mar	0.000	0.013	0.032	0.120	0%	3%	7%	28%
10	11-Mar	0.000	0.013	0.037	0.181	0%	3%	8%	42%
11	18-Mar	0.000	0.019	0.035	0.378	0%	4%	8%	87%
12	25-Mar	0.000	0.018	0.037	0.450	0%	4%	9%	103%
13	1-Apr	0.000	0.025	0.055	0.381	0%	6%	13%	88%
14	8-Apr	0.001	0.022	0.100	0.404	0%	5%	23%	93%
15	15-Apr	0.011	0.094	0.203	1.307	3%	22%	47%	300%
16	22-Apr	0.033	0.212	0.401	1.383	8%	49%	92%	317%
17	29-Apr	0.137	0.481	1.095	2.008	31%	110%	251%	461%
18	6-May	0.385	0.505	1.202	5.062	88%	116%	276%	1162%
19	13-May	0.556	0.782	1.127	4.460	128%	180%	259%	1024%
20	20-May	0.391	1.058	1.790	4.935	90%	243%	411%	1133%
21	27-May	0.296	1.095	1.857	5.077	68%	251%	426%	1166%
22	3-Jun	0.433	0.778	1.469	5.388	100%	179%	337%	1237%
23	10-Jun	0.180	0.700	1.427	3.331	41%	161%	328%	765%
24	17-Jun	0.144	0.746	1.299	3.973	33%	171%	298%	912%
25	24-Jun	0.199	0.410	0.912	3.560	46%	94%	209%	817%
26	1-Jul	0.086	0.455	0.620	2.454	20%	104%	142%	563%
27	8-Jul	0.026	0.226	0.454	2.134	6%	52%	104%	490%
28	15-Jul	0.019	0.130	0.322	1.588	4%	30%	74%	365%
29	22-Jul	0.014	0.101	0.177	1.060	3%	23%	41%	243%
30	29-Jul	0.020	0.073	0.134	0.610	5%	17%	31%	140%
31	5-Aug	0.015	0.048	0.095	0.394	3%	11%	22%	90%
32	12-Aug	0.012	0.039	0.077	0.493	3%	9%	18%	113%
33	19-Aug	0.015	0.031	0.052	0.894	3%	7%	12%	205%
34	26-Aug	0.003	0.025	0.067	0.342	1%	6%	15%	79%
35	2-Sep	0.012	0.022	0.061	0.324	3%	5%	14%	74%
36	9-Sep	0.009	0.019	0.050	0.232	2%	4%	11%	53%
37	16-Sep	0.003	0.013	0.033	0.139	1%	3%	8%	32%
38	23-Sep	0.000	0.018	0.044	0.596	0%	4%	10%	137%
39	30-Sep	0.000	0.018	0.043	0.349	0%	4%	10%	80%
40	7-Oct	0.000	0.015	0.031	0.244	0%	3%	7%	56%
41	14-Oct	0.000	0.022	0.039	0.364	0%	5%	9%	84%
42	21-Oct	0.000	0.031	0.057	0.480	0%	7%	13%	110%
43	28-Oct	0.022	0.031	0.050	0.310	5%	7%	12%	71%
44	4-Nov	0.018	0.032	0.061	0.283	4%	7%	14%	65%
45	11-Nov	0.010	0.041	0.072	0.290	2%	10%	17%	67%
46	18-Nov	0.011	0.020	0.076	0.216	3%	4%	17%	50%
47	25-Nov	0.002	0.017	0.049	0.173	0%	4%	11%	40%
48	2-Dec	0.000	0.016	0.043	0.154	0%	4%	10%	35%
49	9-Dec	0.000	0.021	0.041	0.158	0%	5%	9%	36%
50	16-Dec	0.000	0.022	0.040	0.115	0%	5%	9%	26%
51	23-Dec	0.003	0.020	0.037	0.110	1%	5%	8%	25%
52	31-Dec	0.004	0.019	0.030	0.105	1%	4%	7%	24%