

**From:** [Ptolemy, Ron WLRs:EX](#)  
**To:** [Clare Atkinson](#)  
**Cc:** [Tschaplinski, Peter J WLRs:EX](#); [Bobrowski, Russell FOR:EX](#)  
**Subject:** RE: Bella Coola and Dean River  
**Date:** March 30, 2023 4:51:30 PM  
**Attachments:** [image001.png](#)  
[image003.png](#)

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Hi Clare!

Sorry for the delay; busy time of year given “March Madness” and other distractions.

Please find a summary table by year and site for the Dean River which includes the most current data to 2022. I would statistically structure the among year contrast model of standardized steelhead fry density (FPU) on Site and Year effects using SAS JMP or R. Some years like 2015 were limited in scope due to a large flood event on our scheduled 2<sup>nd</sup> day of total population removal estimates at the meso-habitat scale. Other low sample years like 2006 were reconnaissance efforts exploring sampling bias. Year 1988 was a standout year for extremely high steelhead fry abundance with sampling in late August; fry were quite small

Yes there are more data on the Bella Coola River since 2006; surveys of juvenile salmonid abundance have been completed each year to 2022. Adult steelhead counts are sporadic dependent on snorkel survey conditions and road access in March.

For your information (Dean River):

1. Obsv FPU is the observed or estimated number of steelhead fry in 100m<sup>2</sup> Unit;
2. WUA is the fraction of sample area usable by steelhead fry using detailed hydraulic characterization and depth-velocity preferences; this should equate to the extent of site width where fry were observed; you will note few sites were ideal;
3. Std FPU is simply Obsv FPU/WUA;
4. Wt (g) is the mean weight of fry in the site sample; and
5. Biomass (g/100m<sup>2</sup>) is the product of Std FPU times Wt; the empirical upper limit for biomass per Age of steelhead from the aggregate total data for the Dean River is 268 g/100m<sup>2</sup> per Age.

Best regards,

Ron

Year	Site (km)	Description	Obsv FPU	WUA	Std FPU	Wt (g)	Biomass
2022	4.83	U/S Fisheries Cabin	41	0.56	73	2.57	188
2022	10.12	Hornet	30	0.41	73	2.12	155
2022	15.03	Pats Run	80	0.53	151	1.73	261
2022	18.64	12 Mile (Bridge)	17	0.36	47	2.46	116
2022	21.62	New Anchor Hole	30	0.48	63	2.03	127
2022	23.79	B/W Anchor & Willow	64	0.31	206	2.38	491
2022	27.25	Willow	83	0.82	101	2.44	247
2022	30.8	300m D/S Kalone Creek	97	0.36	269	1.64	442
2022	34.9	3 km U/S Kalone Creek					
2022	38.1	Slide (Omitted for safety reasons)					
2022	41.22	U/S Danny's Upper Camp	55	0.53	104	2.5	259
2022	45.41	d/s Crag Creek--Heaven's Gate	79	0.79	100	2.04	204
2022	47.53	3 km u/s Crag Creek	71	0.52	137	2.87	392

2022	54.37	DS Takia	25	0.37	68	2.64	178
2022		Lower Takia River (Takia 1)	50	0.26	192	1.16	223
2022		Takia 2_4km US Junction					
2022	50	D/S Takia 2					
2019	4.83	U/S Fisheries Cabin	71	0.43	165	1.44	238
2019	10.12	Hornet	133	0.82	162	1.78	289
2019	15.03	Pats Run	199	0.38	524	1.6	838
2019	18.64	12 Mile (Bridge)	155	0.77	201	1.86	374
2019	21.62	New Anchor Hole	53	0.61	87	1.63	142
2019	23.79	B/W Anchor & Willow	81	0.64	127	1.45	184
2019	27.25	Willow	79	0.6	132	1.37	180
2019	30.8	300m D/S Kalone Creek	97	0.36	269	1.64	442
2019	34.9	3 km U/S Kalone Creek					
2019	38.1	Slide (Omitted for safety reasons)					
2019	41.22	U/S Danny's Upper Camp	160	0.65	246	1.46	359
2019	45.41	d/s Crag Creek--Heaven's Gate	234	0.67	349	1.64	573
2019	47.53	3 km u/s Crag Creek					
2019	54.37	DS Takia	50	0.76	66	1.92	126
2019		Lower Takia River (Takia 1)					
2019		Takia 2_4km US Junction					
2019	50	D/S Takia 2					
2018	4.83	U/S Fisheries Cabin	26	0.67	39	1.54	40
2018	10.12	Hornet	20	0.54	37	1.99	40
2018	15.03	Pats Run	76	0.66	115	1.68	128
2018	18.64	12 Mile (Bridge)	58	0.64	91	1.79	104
2018	21.62	New Anchor Hole	35	0.66	53	2.59	91
2018	23.79	B/W Anchor & Willow	94	0.61	153	2.12	199
2018	27.25	Willow	33	0.41	80	1.77	58
2018	30.8	300m D/S Kalone Creek	105	0.25	420	1.4	147
2018	34.9	3 km U/S Kalone Creek	82	0.85	96	1.71	140
2018	38.1	Slide (Omitted for safety reasons)					
2018	41.22	U/S Danny's Upper Camp	27	0.47	58	2.72	73
2018	45.41	d/s Crag Creek--Heaven's Gate	236	0.68	346	1.37	323
2018	47.53	3 km u/s Crag Creek	80	0.30	263	1.96	157
2018	54.37	DS Takia	99	0.31	322	1.47	146
2018		Lower Takia River (Takia 1)	58	0.69	84	1.15	67
2018		Takia 2_4km US Junction	19	0.35	55	2.46	47
2018	50	D/S Takia 2	111	0.59	188	3.52	391
2017	4.83	U/S Fisheries Cabin	115	0.69	166	1.1	127
2017	10.12	Hornet	173	0.69	250	0.72	125
2017	15.03	Pats Run	55	0.38	144	1.49	82
2017	18.64	12 Mile (Bridge)	96	0.47	206	1.48	142
2017	21.62	New Anchor Hole	134	0.65	205	1.52	204
2017	23.79	B/W Anchor & Willow	82	0.43	190	2.01	165
2017	27.25	Willow	116	0.85	136	1.85	215
2017	30.8	300m D/S Kalone Creek	86	0.59	147	0.97	83
2017	34.9	3 km U/S Kalone Creek	82	0.85	96	1.71	140
2017	38.1	Slide (Omitted for safety reasons)					
2017	41.22	U/S Danny's Upper Camp	94	0.44	213	1.19	112
2017	45.41	d/s Crag Creek--Heaven's Gate	205	0.81	254	1.27	260
2017	47.53	3 km u/s Crag Creek					
2017	54.37	DS Takia	92	0.47	197	0.99	91
2017		Lower Takia River (Takia 1)					
2017		Takia 2_4km US Junction					
2017	50	D/S Takia 2					
2016	4.83	U/S Fisheries Cabin	186	0.55	339	1.47	499
2016	10.12	Hornet	100	0.55	181	1.47	267
2016	15.03	Pats Run	70	0.61	115	1.31	150
2016	18.64	12 Mile (Bridge)	189	0.53	360	1.2	432
2016	21.62	New Anchor Hole	51	0.59	87	1.93	167
2016	23.79	B/W Anchor & Willow	192	0.59	328	1.59	521
2016	27.25	Willow	61	0.87	70	1.18	83
2016	30.8	300m D/S Kalone Creek	51	0.68	75	1.8	135
2016	34.9	3 km U/S Kalone Creek					
2016	38.1	Slide (Omitted for safety reasons)					
2016	41.22	U/S Danny's Upper Camp	36	0.61	59	1.86	110
2016	45.41	d/s Crag Creek--Heaven's Gate	61	0.79	77	1.25	96
2016	47.53	3 km u/s Crag Creek	100	0.54	184	1.38	254
2016	54.37	DS Takia	45	0.34	130	1.93	252
2016		Lower Takia River (Takia 1)	67	0.41	165	1.74	287
2016		Takia 2_4km US Junction					
2016	50	D/S Takia 2					
2015	4.83	U/S Fisheries Cabin	49	0.61	121	1.94	235
2015	10.12	Hornet			135		
2015	15.03	Pats Run	54	0.5	108	1.91	206
2015	18.64	12 Mile (Bridge)	70	0.52	134	1.68	225
2015	21.62	New Anchor Hole	49	0.61	80	1.94	155
2015	23.79	B/W Anchor & Willow			96		
2014	4.83	U/S Fisheries Cabin	74	0.73	101	1.43	144
2014	10.12	Hornet	61	0.72	85	1.54	131
2014	15.03	Pats Run	36	0.4	89	2.21	197
2014	18.64	12 Mile (Bridge)	41	0.56	73	1.6	117
2014	21.62	New Anchor Hole	56	0.56	100	2.43	243
2014	23.79	B/W Anchor & Willow	49	0.76	64	1.96	125
2014	27.25	Willow	73	0.62	118	2.1	248
2014	30.8	300m D/S Kalone Creek					
2014	34.9	3 km U/S Kalone Creek	51	0.85	60	1.82	109
2014	38.1	Slide	80	0.66	122	1.25	153
2014	41.22	U/S Danny's Upper Camp	36	0.25	145	2.47	358
2014	45.41	d/s Crag Creek--Heaven's Gate	161	0.52	307	1.02	313
2014	47.53	3 km u/s Crag Creek	105	0.45	233	1.2	280
2014	54.37	DS Takia	59	0.45	130	1.89	246
2014		Lower Takia River (Takia 1)	17	0.2	84	1.67	140
2014		Takia 2_4km US Junction	170	0.58	292	0.83	242

2011	4.83	U/S Fisheries Cabin	11	0.48	23	1.29	30
2011	10.12	Hornet	105	0.73	126	1	126
2011	15.03	Pats Run	67	0.4	167	0.93	155
2011	18.64	12 Mile (Bridge)	67	0.8	84	0.81	68
2011	21.62	New Anchor Hole	30	0.8	38	1.4	53
2011	23.79	B/W Anchor & Willow	115	0.62	184	1.25	230
2011	27.25	Willow	84	0.53	158	0.93	147
2011	30.8	300m D/S Kalone Creek	69	0.4	172	0.86	148
2011	34.9	3 km U/S Kalone Creek	101	0.85	119	0.84	100
2011	38.1	Slide	30	0.2	151	1.25	189
2011	41.22	U/S Danny's Upper Camp	41	0.25	166	2.15	357
2011	45.41	d/s Crag Creek--Heaven's Gate	71	0.52	136	1.02	139
2011	47.53	3 km u/s Crag Creek	65	0.45	145	1.2	174
2011	54.37	DS Takia	88	0.45	195	1.19	232
2011		Lower Takia River (Takia 1)	96	0.6	160	0.94	150
2011		Takia 2_4km US Junction	101	0.58	174	0.83	144
2009	4.83	U/S Fisheries Cabin	60	0.58	103	1.5	155
2009	10.12	Hornet	50	0.43	118	1.25	148
2009	15.03	Pats Run	98	0.4	233	1.28	298
2009	18.64	12 Mile (Bridge)	74	0.47	58	1.32	77
2009	21.62	New Anchor Hole	105	0.7	151	1.6	242
2009	23.79	B/W Anchor & Willow	93	0.57	162	2.05	332
2009	27.25	Willow	44	0.51	85	2.17	184
2009	30.8	300m D/S Kalone Creek	84	0.62	135	1.57	212
2009	34.9	3 km U/S Kalone Creek	67	0.53	127	1.52	193
2009	38.1	Slide	3	0.26	11	1.64	18
2009	41.22	U/S Danny's Upper Camp	70	0.64	109	1.85	202
2009	45.41	d/s Crag Creek--Heaven's Gate	82	0.46	178	1.37	244
2009	47.53	3 km u/s Crag Creek	64	0.52	122	1.67	204
2009	54.37	DS Takia	67	0.56	119	1.35	161
2009		Lower Takia River (Takia 1)	131	0.52	252	1.08	272
2009		Takia 2_4km US Junction	53	0.48	111	1.11	123
2008	4.83	U/S Fisheries Cabin	21	0.23	89	1.18	105
2008	10.12	Hornet	40	0.45	89	1.05	93
2008	15.03	Pats Run	28	0.4	69	1.73	119
2008	18.64	12 Mile (Bridge)	31	0.64	48	1.56	75
2008	21.62	New Anchor Hole	58	0.49	118	1.86	219
2008	23.79	B/W Anchor & Willow	16	0.41	40	1.86	74
2008	27.25	Willow	50	0.56	88	1.88	165
2008	30.8	300m D/S Kalone Creek	13	0.4	32	2.42	77
2008	34.9	3 km U/S Kalone Creek	46	0.3	152	1.62	246
2008	38.1	Slide	87	0.3	132	1.73	228
2008	41.22	U/S Danny's Upper Camp	87	0.64	50	1.73	87
2008	45.41	d/s Crag Creek--Heaven's Gate	54	0.51	106	1.25	133
2008	47.53	3 km u/s Crag Creek	58	0.44	132	1.56	206
2008	54.37	DS Takia	84	0.51	163	1.38	225
2008		Lower Takia River (Takia 1)	76	0.76	101	3.11	314
2008		Takia 2_4km US Junction	15	0.53	29	0.8	23
2006	4.83	U/S Fisheries Cabin	26	0.38	47	2.21	104
2006	10.12	Hornet	71	0.35	198	1.64	325
2006	18.64	12 Mile (Bridge)	64	0.59	104	1.98	206
2006	27.25	Willow	61	0.72	82	1.83	150
2006	45.41	d/s Crag Creek--Heaven's Gate	94	0.83	107	2.2	235
2006		Lower Takia River (Takia 1)	66	0.57	113	1.7	192
1988	4.83	U/S Fisheries Cabin	365	0.68	537	0.88	473
1988	10.12	Hornet	119	0.51	239	0.91	217
1988	15.03	Pats Run	143	0.83	178	0.79	141
1988	18.64	12 Mile (Bridge)	234	0.71	330	0.62	205
1988	21.62	New Anchor Hole	318	0.85	374	0.67	251
1988	23.79	B/W Anchor & Willow					
1988	27.25	Willow	323	0.74	436	0.75	327
1988	30.8	300m D/S Kalone Creek					
1988	34.9	3 km U/S Kalone Creek	74	0.43	172	1.36	234
1988	38.1	Slide					
1988	41.22	U/S Danny's Upper Camp	104	0.67	155	0.63	98
1988	45.41	d/s Crag Creek--Heaven's Gate	302	0.64	472	0.6	283
1988	47.53	3 km u/s Crag Creek	60	0.43	172	0.86	148
1988	54.37	DS Takia	84	0.53	159	0.79	126
1988		Lower Takia River (Takia 1)	250	0.57	439	0.42	184
1988		Takia 2_4km US Junction	85	0.6	173	0.55	95
1988		Takia 3	79	0.52	152	0.67	102
1988		Takia 4	133	0.68	196	0.68	133

**From:** Clare Atkinson <catkinson@PSF.CA>  
**Sent:** Tuesday, March 21, 2023 4:10 PM  
**To:** Ptolemy, Ron WLRS:EX <Ron.Ptolemy@gov.bc.ca>  
**Subject:** Bella Coola and Dean River

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Hi Ron,