California Department of Fish and Wildlife
Stream Evaluation Report 2021-04

INSTREAM FLOW EVALUATION: JUVENILE STEELHEAD AND COHO SALMON REARING IN REDWOOD CREEK, HUMBOLDT COUNTY

APPENDICES

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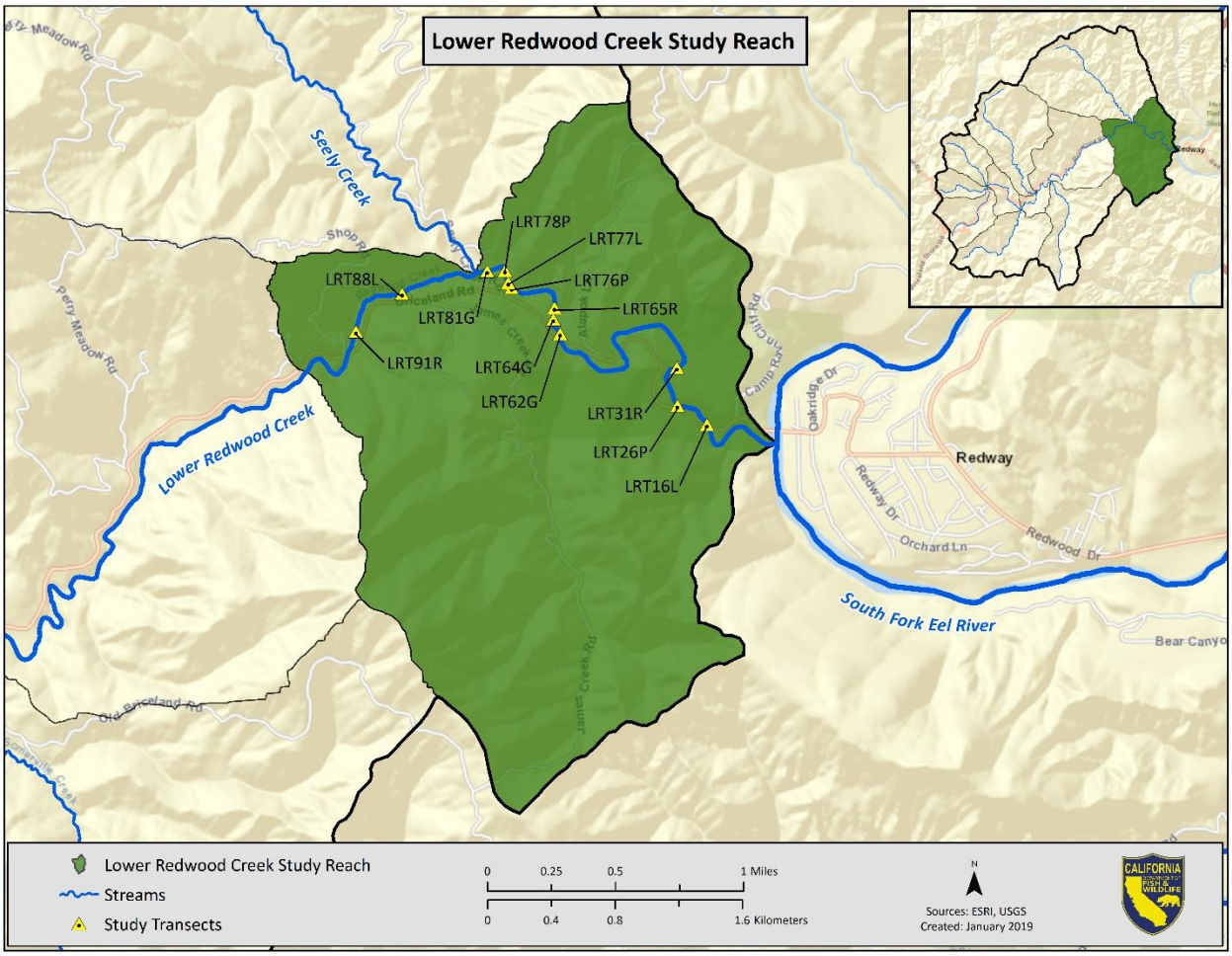
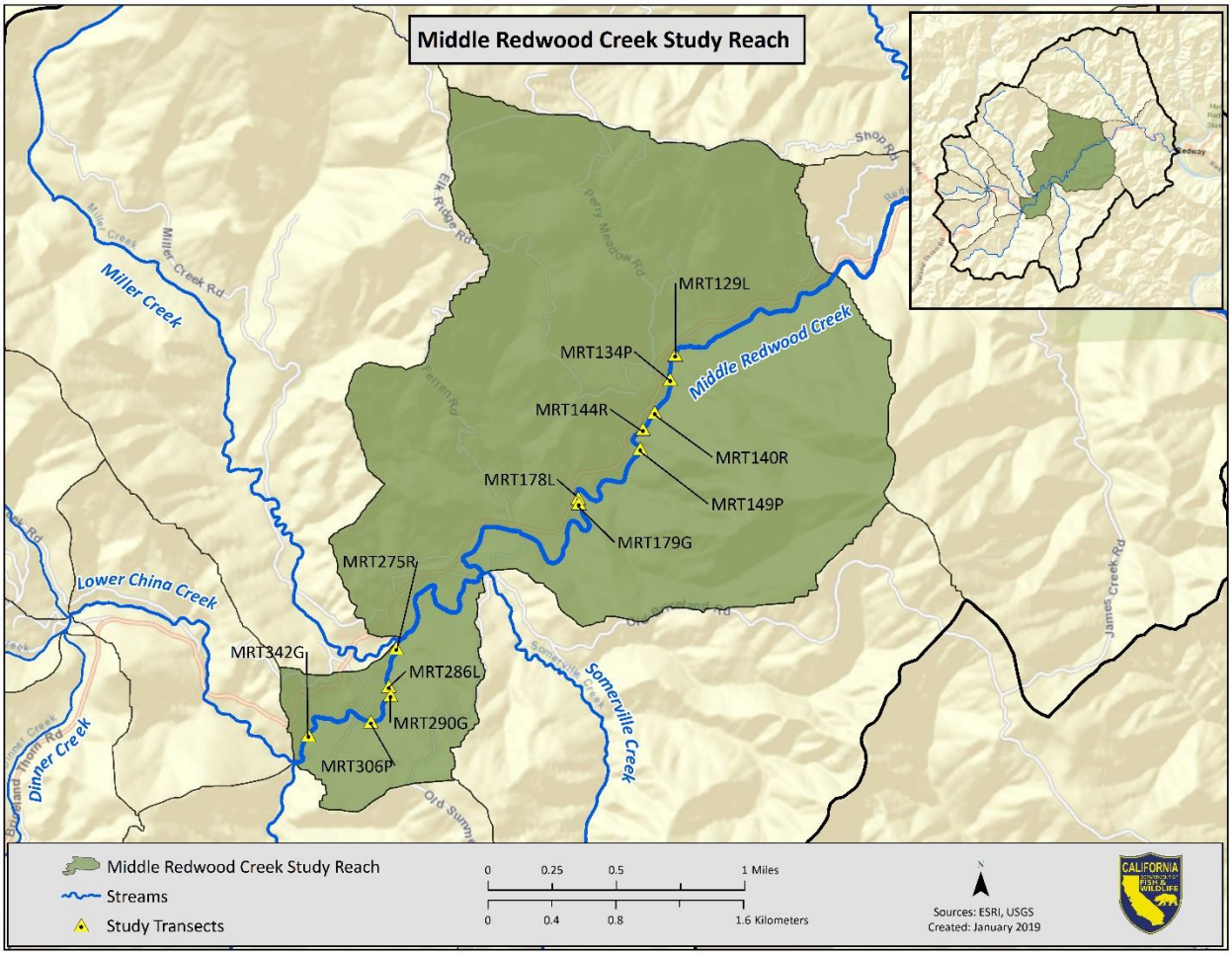


Figure A-1. Lower Redwood Creek reach study transect locations.



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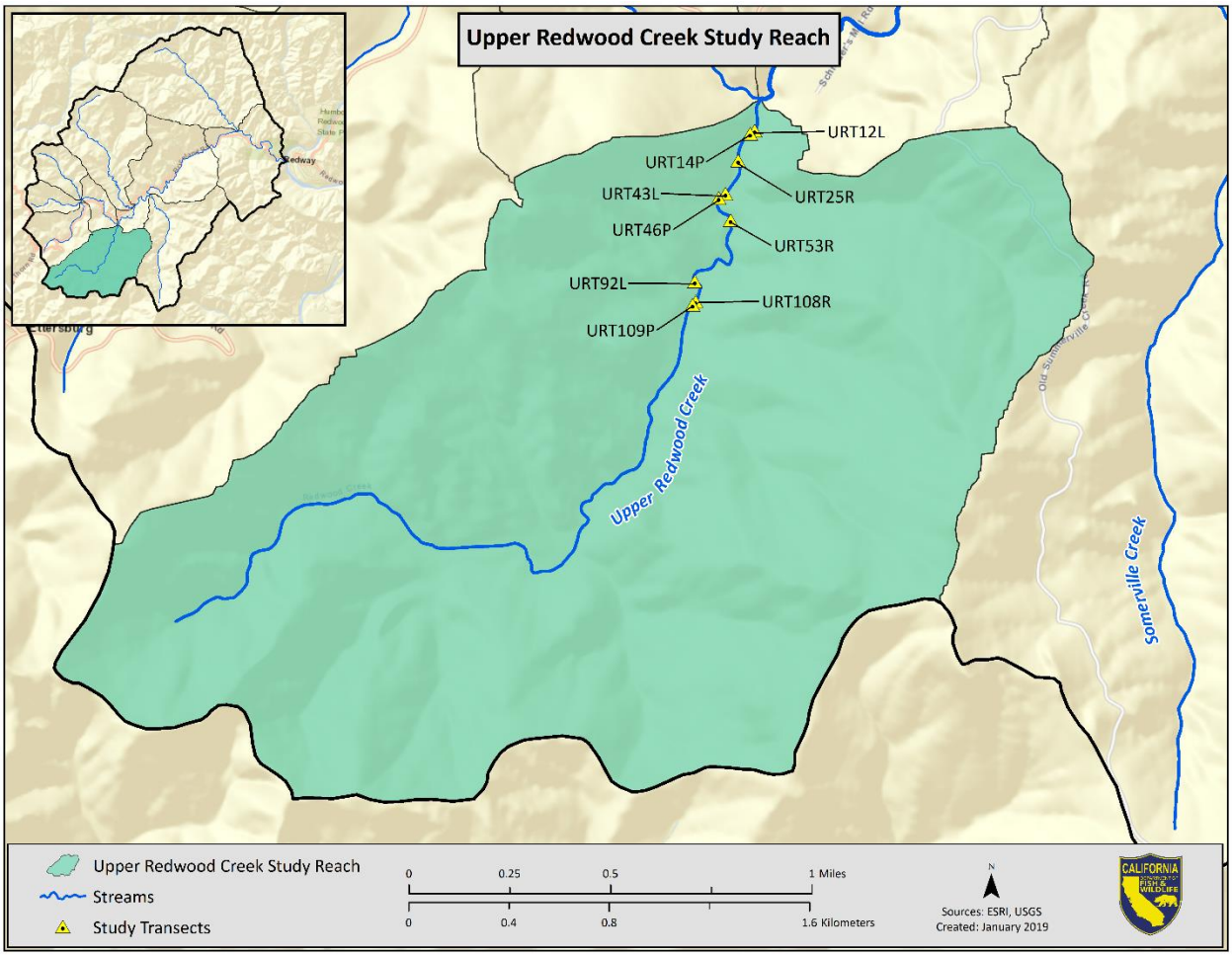

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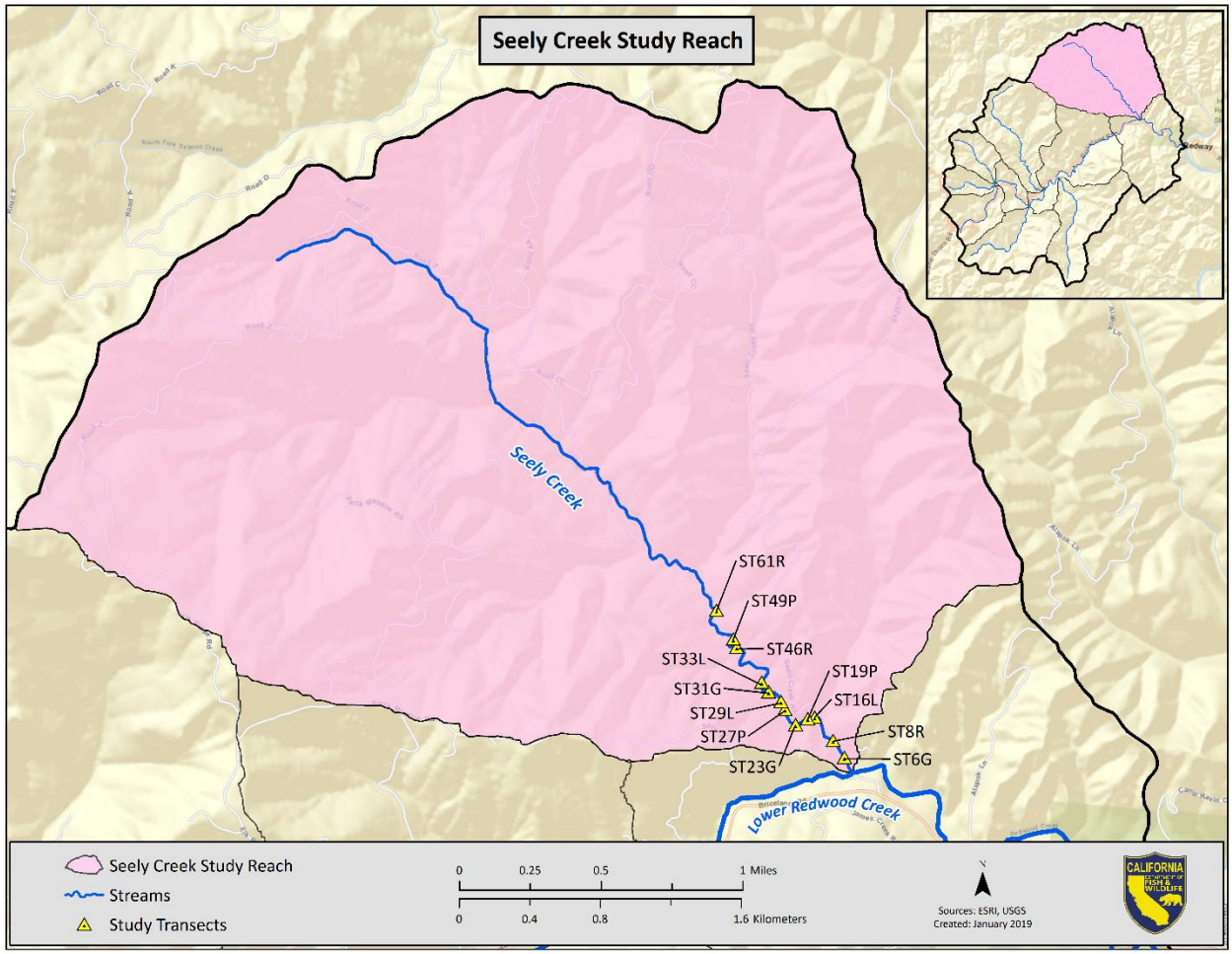

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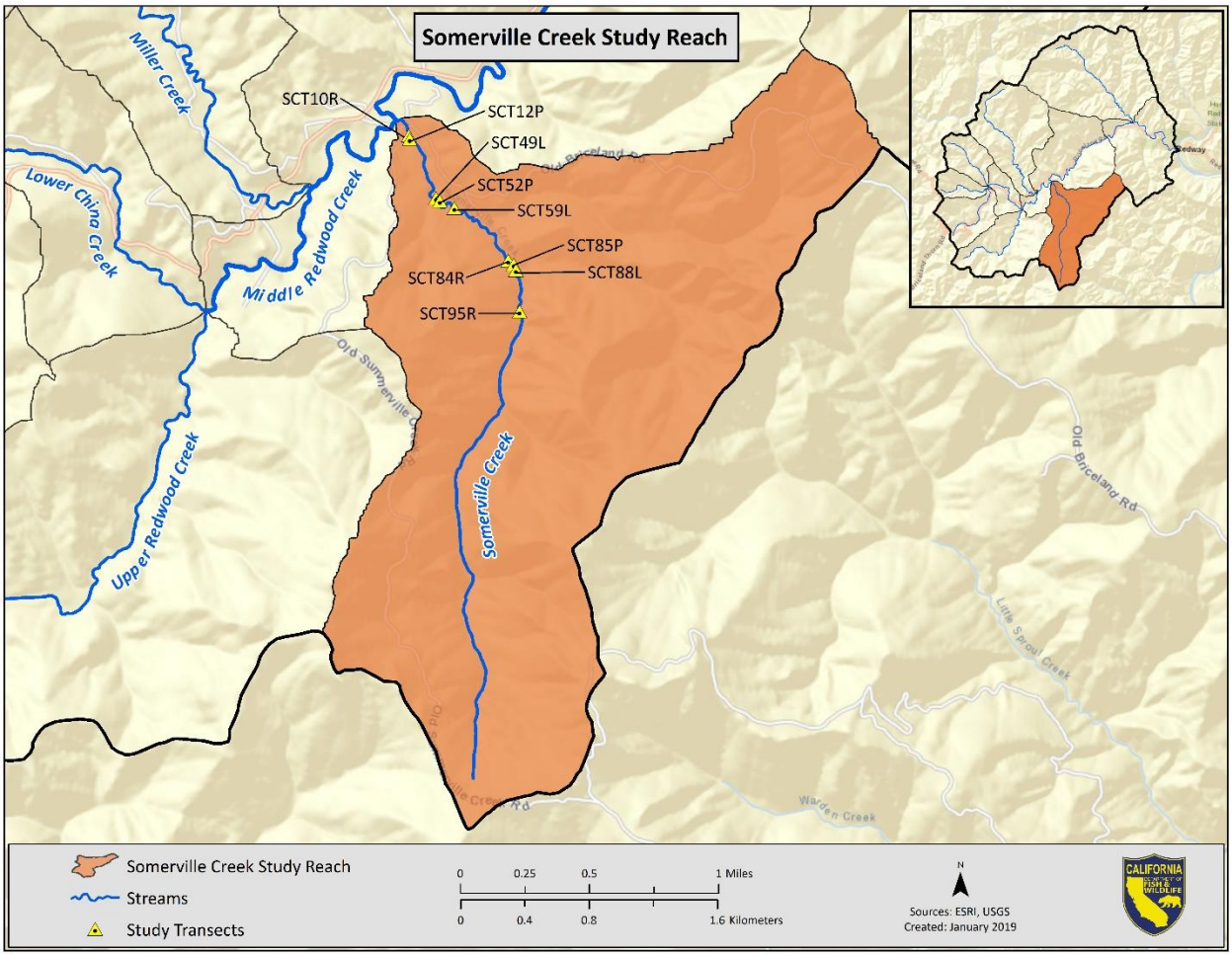

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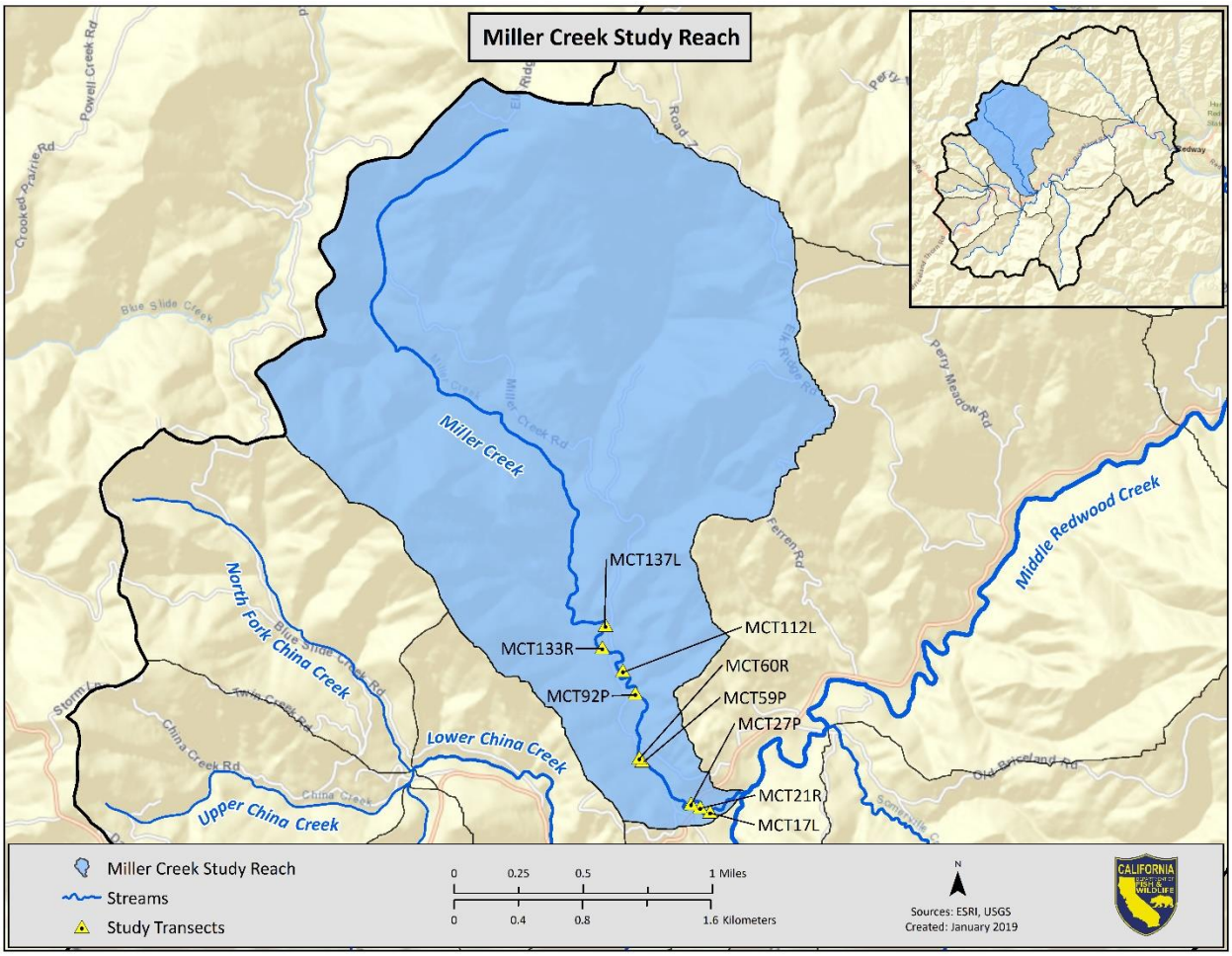
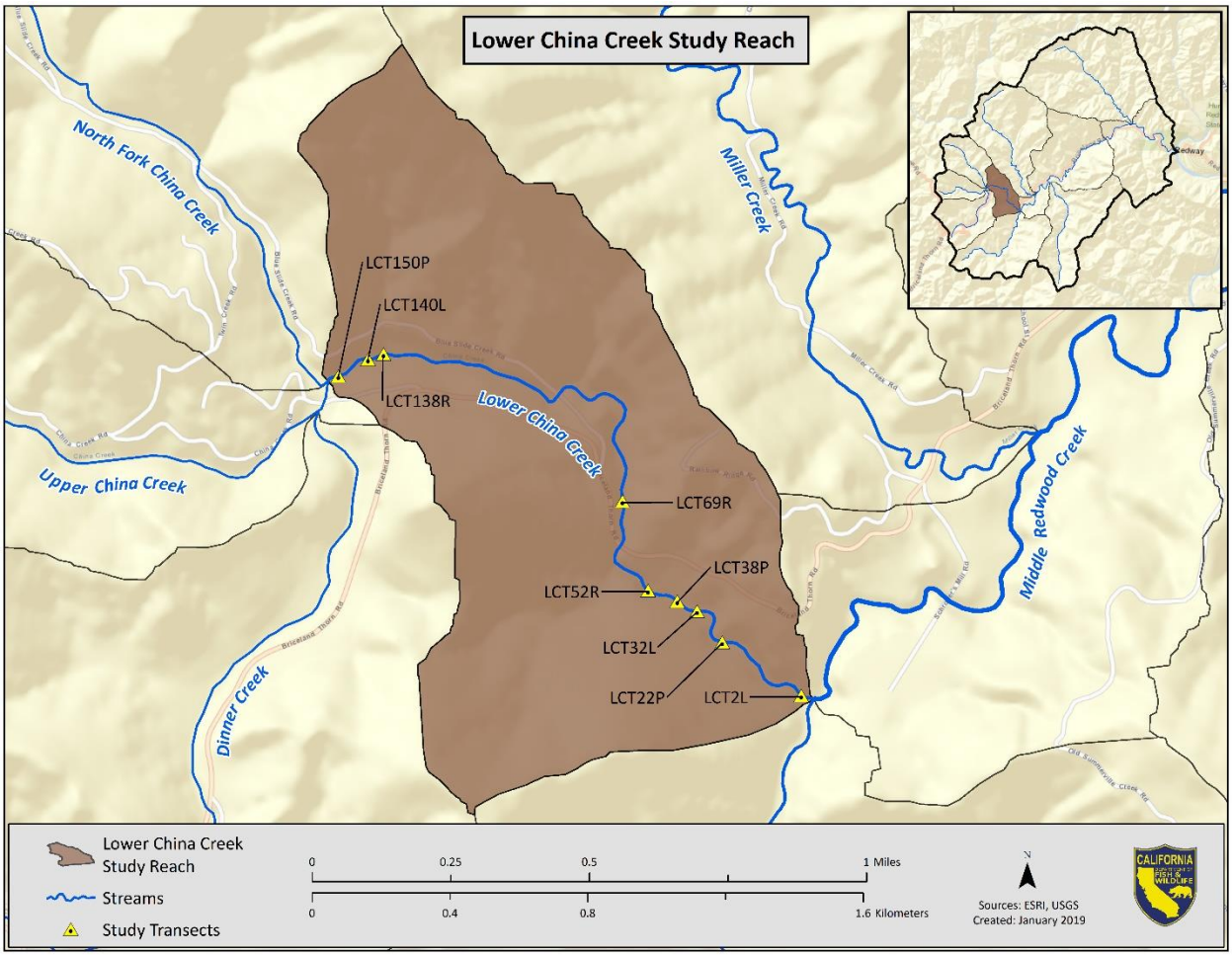


Figure A-6. Miller Creek study transect locations.



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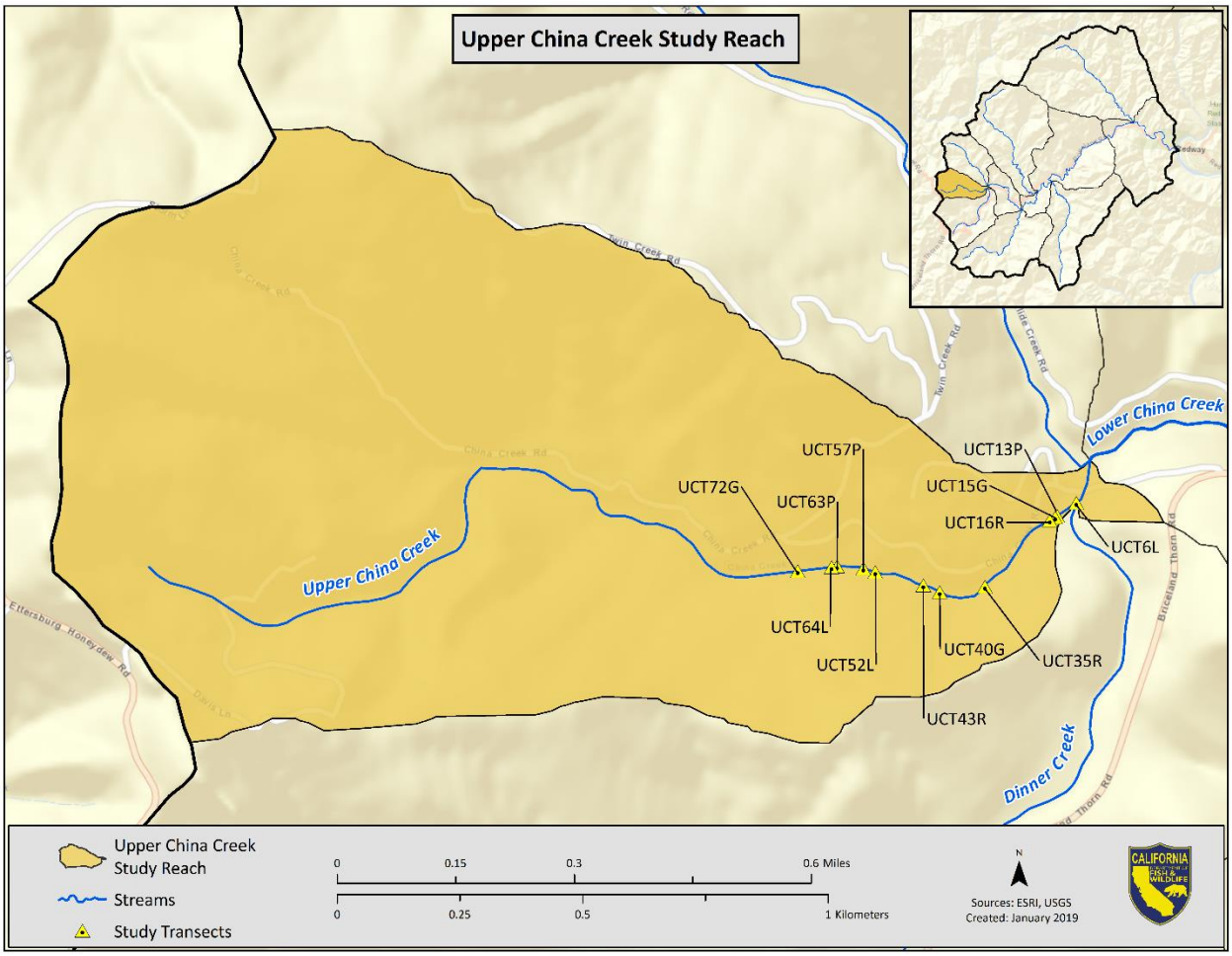
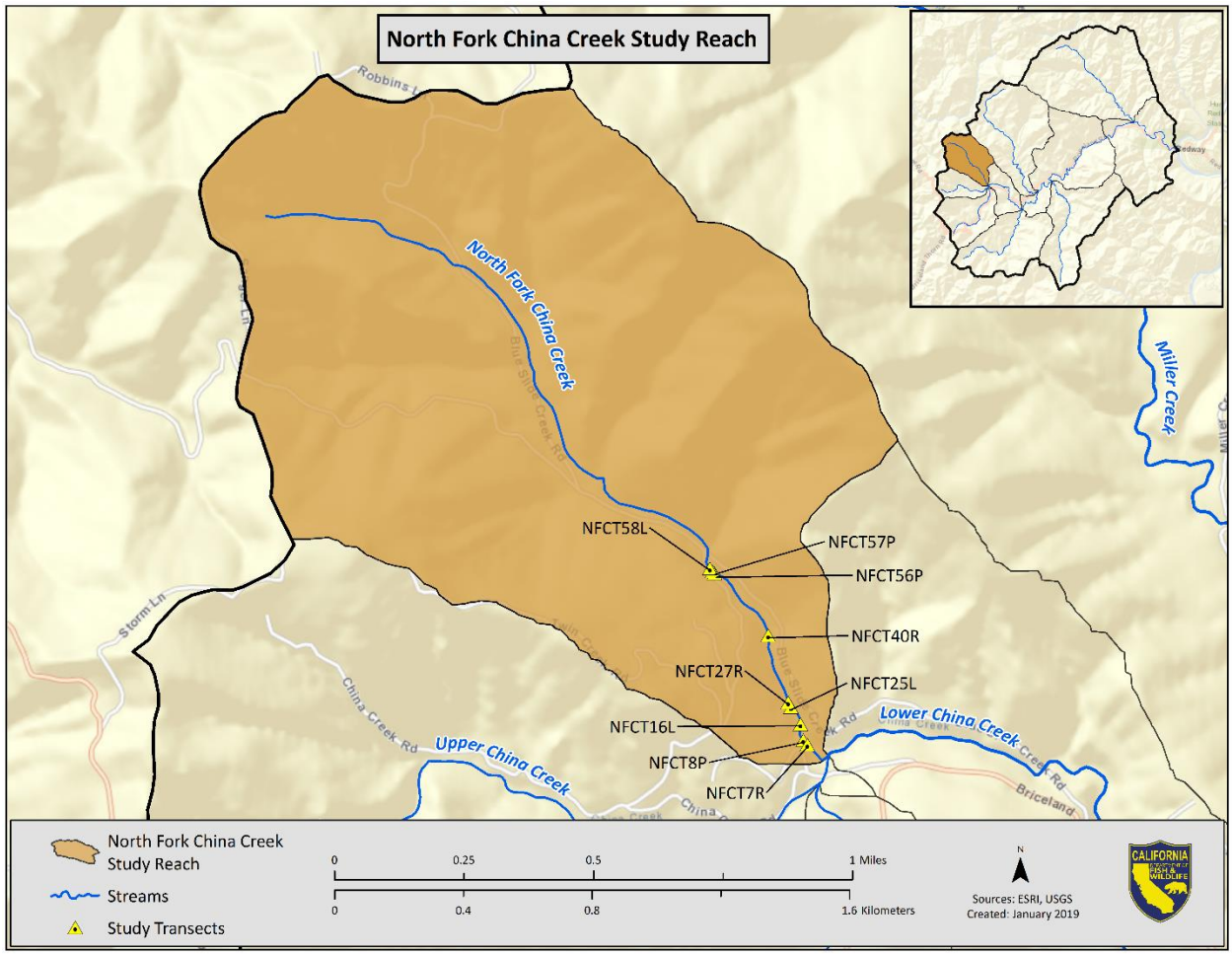


Figure A-8. Upper China Creek study transect locations.



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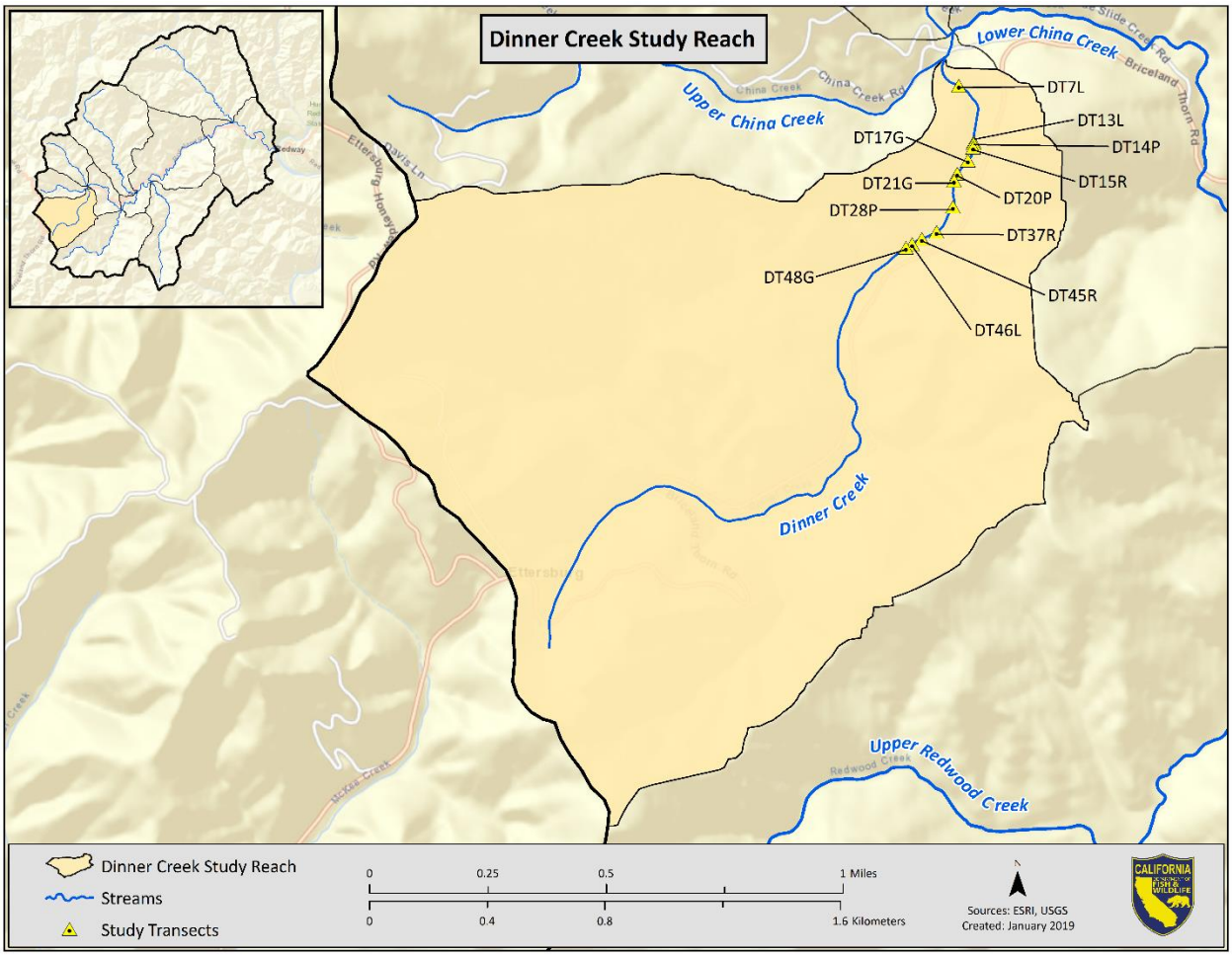

Figure A-10. Dinner Creek study transect locations.

APPENDIX B. HABITAT – STREAMFLOW TABLES

The following appendix shows the estimated AWS (area-weighted suitability) values for each species and life stage by reach. The lowest modelable flow for each reach was set using the recommended velocity adjustment factor (VAF) range. More details are provided in Section 2.3 of the *Hydraulic Model Calibration Report for Instream Flow Evaluation: Juvenile Steelhead and Coho Salmon Rearing in Redwood Creek, Humboldt County* report (Cowan 2021).

Table B-1. Lower Redwood Creek steelhead and Coho Salmon habitat/streamflow relationship. Peak AWS values for each life stage are bolded in grey with a dagger (†).

Discharge (cfs)	AWS for Steelhead Fry (<6 cm)	AWS for Steelhead Juveniles (≥6 cm)	AWS for Coho Salmon Fry (<6 cm)	AWS for Coho Salmon Juveniles (≥6 cm)
1	12.586	6.835	16.452	14.374
6	**13.759†**	10.330	**16.985†**	**16.031†**
11	12.944	12.566	15.060	15.589
16	11.490	13.803	13.189	14.516
21	10.184	14.549	11.752	13.499
26	9.217	15.026	10.778	12.742
31	8.461	15.300	10.115	12.104
36	7.901	15.428	9.546	11.548
41	7.445	15.473	9.151	11.050
46	7.092	15.473	9.333	10.645
51	7.236	15.537	9.770	10.625
56	7.804	15.657	9.858	10.945
61	7.949	15.661	9.916	10.947
66	7.998	**15.671†**	9.700	10.852
71	7.931	15.624	9.452	10.699
76	7.764	15.498	9.259	10.535
81	7.616	15.351	9.182	10.420
86	7.540	15.212	9.109	10.381
91	7.473	15.061	9.022	10.357
96	7.356	14.872	9.056	10.294
101	7.294	14.692	9.233	10.283
106	7.358	14.558	9.482	10.364
111	7.469	14.459	9.583	10.480
116	7.627	14.416	9.542	10.616
121	7.637	14.352	9.566	10.662
126	7.595	14.272	9.503	10.679
131	7.595	14.232	9.446	10.728
136	7.518	14.149	9.388	10.722
141	7.438	14.068	9.328	10.722

Table B-2. Middle Redwood Creek steelhead and Coho Salmon habitat/streamflow relationship. Peak AWS values for each life stage are bolded in grey with a dagger (†).

Discharge (cfs)	AWS for Steelhead Fry (<6 cm)	AWS for Steelhead Juveniles (≥6 cm)	AWS for Coho Salmon Fry (<6 cm)	AWS for Coho Salmon Juveniles (≥6 cm)
0	5.974	2.272	7.975	5.040
2	**10.403†**	6.730	**13.023†**	12.840
4	10.081	8.036	12.429	**13.140†**
6	9.506	9.000	11.799	12.957
8	9.002	9.841	10.962	12.632
10	8.362	10.496	10.157	12.102
12	7.740	11.020	9.397	11.527
14	7.167	11.451	8.795	10.956
16	6.667	11.815	8.251	10.421
18	6.286	12.165	7.767	9.960
20	5.939	12.464	7.384	9.533
22	5.650	12.703	7.031	9.159
24	5.409	12.892	6.734	8.831
26	5.171	13.013	6.478	8.521
28	4.969	13.111	6.242	8.244
30	4.787	13.171	6.036	7.988
32	4.636	13.209	5.869	7.763
34	4.508	**13.223†**	5.722	7.565
36	4.410	13.222	5.582	7.397
38	4.328	13.197	5.437	7.249
40	4.245	13.151	5.299	7.109
42	4.155	13.074	5.165	6.972
44	4.061	12.983	5.038	6.842
46	3.970	12.883	4.920	6.720
48	3.883	12.766	4.810	6.606
50	3.798	12.641	4.709	6.489
52	3.718	12.511	4.615	6.381
54	3.645	12.373	4.528	6.282
56	3.576	12.230	4.446	6.189

Table B-3. Upper Redwood Creek steelhead and Coho Salmon habitat/streamflow relationship. Peak AWS values for each life stage are bolded in grey with a dagger (†).

Discharge (cfs)	AWS for Steelhead Fry (<6 cm)	AWS for Steelhead Juveniles (≥6 cm)	AWS for Coho Salmon Fry (<6 cm)	AWS for Coho Salmon Juveniles (≥6 cm)
1	6.008	3.455	**7.560†**	**5.848†**
3	**6.012†**	4.914	6.653	5.777
5	5.085	5.835	5.428	4.758
7	4.350	6.558	4.451	3.861
9	3.775	7.147	3.723	3.161
11	3.321	7.600	3.214	2.644
13	2.927	7.863	2.861	2.251
15	2.613	7.975	2.590	1.966
17	2.436	8.070	2.393	1.804
19	2.303	**8.100†**	2.253	1.689
21	2.186	8.060	2.145	1.597
23	2.084	7.953	2.051	1.520
25	1.990	7.788	1.961	1.448
27	1.910	7.594	1.885	1.385
29	1.839	7.353	1.815	1.327
31	1.782	7.090	1.749	1.278
33	1.735	6.812	1.689	1.234
35	1.696	6.533	1.635	1.194
37	1.661	6.262	1.587	1.159
39	1.627	6.003	1.544	1.126
41	1.589	5.757	1.502	1.091
43	1.550	5.535	1.462	1.058
45	1.510	5.329	1.422	1.026
47	1.472	5.143	1.385	0.998
49	1.436	4.972	1.349	0.971
51	1.400	4.810	1.315	0.945
53	1.365	4.660	1.285	0.919
55	1.333	4.521	1.264	0.896
57	1.304	4.391	1.243	0.874

Table B-4. Seely Creek steelhead and Coho Salmon habitat/streamflow relationship. Peak AWS values for each life stage are bolded in grey with a dagger (†).

Discharge (cfs)	AWS for Steelhead Fry (<6 cm)	AWS for Steelhead Juveniles (≥6 cm)	AWS for Coho Salmon Fry (<6 cm)	AWS for Coho Salmon Juveniles (≥6 cm)
0	2.903	1.441	4.645	3.264
2	**10.487†**	5.244	**11.570†**	**8.412†**
4	9.395	6.840	9.695	7.547
6	8.142	8.005	8.285	6.708
8	7.090	8.836	7.058	6.039
10	6.219	9.304	6.111	5.489
12	5.559	9.597	5.485	5.070
14	5.055	9.799	5.058	4.759
16	4.669	9.946	4.766	4.531
18	4.376	10.047	4.532	4.357
20	4.145	**10.051†**	4.319	4.217
22	3.982	10.025	4.159	4.125
24	3.866	9.966	4.000	4.065
26	3.741	9.871	3.855	3.999
28	3.587	9.715	3.734	3.915
30	3.450	9.541	3.637	3.845
32	3.334	9.364	3.558	3.791
34	3.232	9.187	3.512	3.739
36	3.147	9.015	3.563	3.692
38	3.139	8.865	3.547	3.699
40	3.177	8.729	3.486	3.740
42	3.130	8.557	3.422	3.717
44	3.072	8.375	3.359	3.687
46	3.018	8.213	3.297	3.661
48	2.962	8.067	3.235	3.634
50	2.905	7.932	3.172	3.607
52	2.845	7.800	3.107	3.579
54	2.783	7.675	3.040	3.550
56	2.721	7.555	2.973	3.517

Table B-5. Somerville Creek steelhead and Coho Salmon habitat/streamflow relationship. Peak AWS values for each life stage are bolded in grey with a dagger (†).

Discharge (cfs)	AWS for Steelhead Fry (<6 cm)	AWS for Steelhead Juveniles (≥6 cm)	AWS for Coho Salmon Fry (<6 cm)	AWS for Coho Salmon Juveniles (≥6 cm)
1	**6.506†**	3.058	**7.177†**	**4.950†**
3	5.840	4.735	5.789	4.435
5	4.890	5.947	4.815	3.728
7	4.178	6.947	3.998	3.190
9	3.614	7.604	3.467	2.789
11	3.220	8.022	3.072	2.509
13	2.864	8.163	2.755	2.262
15	2.613	**8.211†**	2.572	2.084
17	2.433	8.172	2.436	1.955
19	2.302	8.070	2.318	1.860
21	2.197	7.935	2.218	1.783
23	2.111	7.795	2.128	1.721
25	2.037	7.649	2.043	1.670
27	1.971	7.483	1.964	1.624
29	1.902	7.309	1.903	1.575
31	1.833	7.114	1.852	1.526
33	1.769	6.902	1.809	1.482
35	1.717	6.692	1.781	1.445
37	1.671	6.489	1.760	1.411
39	1.632	6.299	1.740	1.382
41	1.605	6.126	1.724	1.361
43	1.590	5.970	1.717	1.349
45	1.578	5.824	1.722	1.341
47	1.565	5.684	1.737	1.332
49	1.548	5.550	1.761	1.321
51	1.531	5.424	1.788	1.310

Table B-6. Miller Creek steelhead and Coho Salmon habitat/streamflow relationship. Peak AWS values for each life stage are bolded in grey with a dagger (†).

Discharge (cfs)	AWS for Steelhead Fry (<6 cm)	AWS for Steelhead Juveniles (≥6 cm)	AWS for Coho Salmon Fry (<6 cm)	AWS for Coho Salmon Juveniles (≥6 cm)
1	**5.614†**	3.872	**7.385†**	7.388
4	4.822	5.580	6.383	**7.407†**
7	4.009	6.333	5.307	6.743
10	3.379	6.620	4.602	6.086
13	2.938	**6.685†**	4.120	5.578
16	2.611	6.647	3.753	5.190
19	2.351	6.558	3.452	4.887
22	2.159	6.506	3.207	4.654
25	2.006	6.403	3.019	4.469
28	1.883	6.204	2.938	4.299
31	1.777	6.014	2.937	4.166
34	1.711	5.756	2.907	4.059
37	1.710	5.572	2.962	3.993
40	1.736	5.412	3.031	3.942
43	1.803	5.283	3.045	3.915
46	1.889	5.184	2.992	3.899
49	1.984	5.105	2.889	3.880
52	2.014	5.020	2.787	3.823
55	1.995	4.930	2.695	3.741
58	1.939	4.835	2.605	3.641
61	1.890	4.713	2.519	3.550
64	1.850	4.609	2.438	3.467
67	1.814	4.523	2.361	3.391
70	1.777	4.446	2.287	3.319
73	1.739	4.379	2.216	3.250
76	1.700	4.316	2.156	3.184
79	1.661	4.259	2.112	3.121
82	1.622	4.206	2.095	3.060

Table B-7. Lower China Creek steelhead and Coho Salmon habitat/streamflow relationship. Peak AWS values for each life stage are bolded in grey with a dagger (†).

Discharge (cfs)	AWS for Steelhead Fry (<6 cm)	AWS for Steelhead Juveniles (≥6 cm)	AWS for Coho Salmon Fry (<6 cm)	AWS for Coho Salmon Juveniles (≥6 cm)
0	4.873	2.177	5.905	4.404
2	**6.364†**	4.602	**7.383†**	**6.288†**
4	5.805	5.916	6.614	5.969
6	5.183	6.699	5.911	5.478
8	4.642	7.361	5.288	4.962
10	4.205	7.936	4.718	4.509
12	3.823	8.295	4.266	4.109
14	3.488	8.513	3.918	3.745
16	3.225	8.627	3.674	3.444
18	3.012	**8.642†**	3.509	3.191
20	2.832	8.602	3.37	2.976
22	2.700	8.561	3.246	2.808
24	2.626	8.536	3.123	2.687
26	2.586	8.515	3.021	2.598
28	2.564	8.497	2.940	2.532
30	2.537	8.462	2.888	2.473
32	2.506	8.410	2.875	2.422
34	2.482	8.344	2.928	2.385
36	2.468	8.271	2.976	2.361
38	2.470	8.192	3.014	2.354
40	2.519	8.141	3.027	2.375
42	2.542	8.040	2.999	2.381
44	2.549	7.927	2.966	2.380
46	2.555	7.821	2.956	2.379
48	2.557	7.722	2.963	2.377
50	2.558	7.629	2.975	2.376

Table B-8. Upper China Creek steelhead and Coho Salmon habitat/streamflow relationship. Peak AWS values for each life stage are bolded in grey with a dagger (†).

Discharge (cfs)	AWS for Steelhead Fry (<6 cm)	AWS for Steelhead Juveniles (≥6 cm)	AWS for Coho Salmon Fry (<6 cm)	AWS for Coho Salmon Juveniles (≥6 cm)
1	3.689	2.304	**4.412†**	**3.168†**
2	**3.705†**	3.126	3.969	3.092
3	3.411	3.720	3.519	2.802
4	3.133	4.188	3.129	2.536
5	2.867	4.555	2.846	2.302
6	2.636	4.837	2.670	2.115
7	2.435	5.050	2.553	1.956
8	2.273	5.207	2.448	1.829
9	2.179	5.347	2.368	1.761
10	2.112	5.465	2.286	1.714
11	2.048	5.564	2.210	1.671
12	1.981	5.646	2.173	1.627
13	1.911	5.697	2.168	1.585
14	1.846	**5.728†**	2.177	1.548
15	1.786	5.725	2.187	1.515
16	1.752	5.719	2.194	1.498
17	1.757	5.710	2.168	1.502
18	1.784	5.704	2.118	1.519
19	1.807	5.689	2.061	1.533
20	1.813	5.671	2.011	1.538
21	1.801	5.645	1.968	1.532

Table B-9. North Fork China Creek steelhead and Coho Salmon habitat/streamflow relationship. Peak AWS values for each life stage are bolded in grey with a dagger (†).

Discharge (cfs)	AWS for Steelhead Fry (<6 cm)	AWS for Steelhead Juveniles (≥6 cm)	AWS for Coho Salmon Fry (<6 cm)	AWS for Coho Salmon Juveniles (≥6 cm)
1	**3.923†**	1.967	**3.914†**	**2.336†**
3	2.408	3.554	1.953	1.233
5	1.625	4.543	1.278	0.818
7	1.212	5.076	1.038	0.649
9	1.024	5.346	0.933	0.593
11	0.917	**5.372†**	0.868	0.564
13	0.852	5.233	0.815	0.537
15	0.812	4.985	0.784	0.519
17	0.785	4.722	0.772	0.503
19	0.772	4.482	0.750	0.506
21	0.765	4.281	0.730	0.509
23	0.750	4.093	0.717	0.503
25	0.733	3.912	0.711	0.495
27	0.714	3.754	0.763	0.486
29	0.704	3.618	1.064	0.481
31	0.805	3.565	1.510	0.538
33	1.170	3.707	1.542	0.735
35	1.488	3.920	1.423	0.890
37	1.487	4.000	1.323	0.872

Table B-10. Dinner Creek steelhead and Coho Salmon habitat/streamflow relationship. Peak AWS values for each life stage are bolded in grey with a dagger (†).

Discharge (cfs)	AWS for Steelhead Fry (<6 cm)	AWS for Steelhead Juveniles (≥6 cm)	AWS for Coho Salmon Fry (<6 cm)	AWS for Coho Salmon Juveniles (≥6 cm)
2	**5.194†**	3.657	**6.052†**	**4.800†**
4	4.904	5.109	5.481	4.575
6	4.472	6.015	4.697	4.203
8	3.976	6.64	4.083	3.796
10	3.549	7.085	3.664	3.447
12	3.211	7.454	3.362	3.184
14	3.005	7.748	3.161	3.023
16	2.859	7.934	3.022	2.907
18	2.748	8.074	2.933	2.846
20	2.659	8.145	2.855	2.808
22	2.578	**8.159†**	2.791	2.78
24	2.504	8.128	2.745	2.763
26	2.436	8.063	2.708	2.753
28	2.372	7.954	2.674	2.744
30	2.319	7.835	2.645	2.743
32	2.274	7.704	2.622	2.745
34	2.238	7.561	2.596	2.752
36	2.204	7.402	2.567	2.757
38	2.168	7.231	2.541	2.759
40	2.13	7.057	2.517	2.758
42	2.092	6.883	2.497	2.756

APPENDIX C. COMID BY REACH

The following table lists the USGS NHDPlus common identifiers (COMIDs) that correspond to each study reach. COMIDs were used to obtain predicted flow data from the Natural Flows Database (rivers.codefornature.org). More details are provided in Section 2.2 of the main report.

Table C-1. List of COMIDs by reach.

Reach	COMID
Lower Redwood Creek	8285238
Middle Redwood Creek	8285234
Upper Redwood Creek	8285332
Seely Creek	8285210
Somerville Creek	8285288
Miller Creek	8285280
Lower China Creek	8285306
Upper China Creek	8285284
North Fork China Creek	8285274
Dinner Creek	8285312

APPENDIX D. FUNCTIONAL FLOW TABLES

The following tables present the functional flow metrics for each Redwood Creek reach not included in the main report. Data was obtained from the Natural Flows Database (California Environmental Flows Working Group 2020). More details are provided in Section 2.2 of the main report. Some metrics (particularly the spring recession rate and fall pulse duration) are not available for every reach.

Table D-1. Predicted functional flow metrics for Middle Redwood Creek by water year type. Values represent median predictions within each water year type, with 10th–90th percentile ranges in parentheses. Functional flow metrics with asterisks (*) are not dependent on water year type. Fall pulse flows may not occur every year. Data from the Natural Flows Database, COMID 8285234 (California Environmental Flows Working Group 2020).

Functional Flow Metric	Wet Year	Moderate Year	Dry Year
Fall pulse flow magnitude (cfs)	20 (7–87)	16 (6–64)	13 (4–66)
Fall pulse flow duration (days)*	3 (2–7)	3 (2–7)	3 (2–7)
Fall pulse flow timing	Oct 20 (Oct 6–Oct 31)	Oct 20 (Oct 8–Nov 11)	Oct 25 (Oct 6–Nov 2)
Median wet-season flow magnitude (cfs)	115 (60–169)	72 (39–140)	42 (20–72)
Wet-season baseflow magnitude (cfs)	34 (15–62)	26 (12–48)	12 (5–24)
Wet-season duration (days)	149 (99–179)	138 (85–172)	126 (77–163)
Wet-season start timing	Nov 23 (Nov 8–Dec 9)	Nov 27 (Nov 12–Dec 15)	Dec 4 (Nov 12–Jan 7)
Spring recession start magnitude (cfs)	268 (92–797)	171 (68–565)	156 (39–416)
Spring recession duration (days)	42 (27–85)	45 (29–93)	48 (30–100)
Spring recession start timing	Apr 16 (Mar 18–Apr 30)	Apr 12 (Mar 12–May 1)	Apr 2 (Mar 12–May 6)
Spring recession rate of change (%)*	6 (3–10)	6 (3–10)	6 (3–10)
Dry-season baseflow magnitude (cfs)	3 (2–5)	3 (1–4)	2 (1–4)

Functional Flow Metric	Wet Year	Moderate Year	Dry Year
Dry-season duration (days)	182 (144–228)	177 (143–224)	180 (136–226)
Dry-season start timing	May 26 (May 4–Jun 20)	Jun 1 (May 6–Jun 22)	May 28 (Apr 24–Jul 2)

Table D-2. Predicted peak functional flow metrics for Middle Redwood Creek by yearly intervals. Values represent median predictions with 10th–90th percentile ranges in parentheses. Peak flows may not occur every year. Data from the Natural Flows Database, COMID 8285234 (California Environmental Flows Working Group 2020).

Functional Flow Metric	All Years
2-year peak flow magnitude (cfs)	1,160 (890–1,570)
2-year peak flow days/year when present	3 (1–19)
2-year peak flow events/year when present	2 (1–5)
5-year peak flow magnitude (cfs)	1,650 (1,600–2,220)
5-year peak flow days/year when present	2 (1–6)
5-year peak flow events/year when present	1 (1–3)
10-year peak flow magnitude (cfs)	2,130 (1,900–2,700)
10-year peak flow days/year when present	2 (1–3)
10-year peak flow events/year when present	1 (1–2)

Table D-3. Predicted functional flow metrics for Upper Redwood Creek by water year type. Values represent median predictions within each water year type, with 10th-90th percentile ranges in parentheses. Functional flow metrics with asterisks (*) are not dependent on water year type. Fall pulse flow duration and spring recession rate of change were not estimated for this and other very small drainages. Data from the Natural Flows Database, COMID 8285332 (California Environmental Flows Working Group 2020).

Functional Flow Metric	Wet Year	Moderate Year	Dry Year
Fall pulse flow magnitude (cfs)	4 (1–14)	3 (1–10)	2 (1–8)
Fall pulse flow duration (days)*	–	–	–
Fall pulse flow timing	Oct 22 (Oct 6–Nov 1)	Oct 23 (Oct 8–Nov 12)	Oct 24 (Oct 7–Nov 6)
Median wet-season flow magnitude (cfs)	18 (8–27)	11 (5–21)	7 (3–11)
Wet-season baseflow magnitude (cfs)	5 (2–8)	4 (2–7)	2 (1–4)
Wet-season duration (days)	149 (96–178)	137 (79–171)	127 (75–171)
Wet-season start timing	Nov 22 (Nov 7–Dec 10)	Nov 27 (Nov 12–Dec 16)	Nov 28 (Nov 7–Dec 25)
Spring recession start magnitude (cfs)	42 (15–127)	32 (11–98)	24 (7–71)
Spring recession duration (days)	43 (28–103)	47 (30–100)	49 (31–105)
Spring recession start timing	Apr 16 (Mar 18–May 1)	Apr 14 (Mar 12–May 2)	Apr 3 (Mar 10–May 7)
Spring recession rate of change (%)*	–	–	–
Dry-season baseflow magnitude (cfs)	1 (<1–1)	<1 (<1–1)	<1 (<1–1)

Dry-season duration (days)	177 (110–227)	172 (108–225)	173 (104–225)
Dry-season start timing	May 28 (May 5–Jun 21)	Jun 1 (May 6–Jun 23)	Jun 1 (Apr 24–Jul 3)

Table D-4. Predicted peak functional flow metrics for Upper Redwood Creek by yearly intervals. Values represent median predictions with 10th–90th percentile ranges in parentheses. Peak flows may not occur every year. Duration and frequency of peak flows were not estimated for this and other very small drainages. Data from the Natural Flows Database, COMID 8285332 (California Environmental Flows Working Group 2020).

Functional Flow Metric	All Years
2-year peak flow magnitude (cfs)	184 (142–258)
2-year peak flow days/year when present	–
2-year peak flow events/year when present	–
5-year peak flow magnitude (cfs)	264 (257–407)
5-year peak flow days/year when present	–
5-year peak flow events/year when present	–
10-year peak flow magnitude (cfs)	340 (303–431)
10-year peak flow days/year when present	–
10-year peak flow events/year when present	–

Table D-5. Predicted functional flow metrics for Seely Creek by water year type. Values represent median predictions within each water year type, with 10th-90th percentile ranges in parentheses. Functional flow metrics with asterisks (*) are not dependent on water year type. Fall pulse flows may not occur every year. Data from the Natural Flows Database, COMID 8285210 (California Environmental Flows Working Group 2020).

Functional Flow Metric	Wet Year	Moderate Year	Dry Year
Fall pulse flow magnitude (cfs)	7 (2–27)	5 (2–16)	4 (1–13)
Fall pulse flow duration (days)*	3 (2–6)	3 (2–6)	3 (2–6)
Fall pulse flow timing	Oct 20 (Oct 7–Nov 7)	Oct 23 (Oct 7–Nov 12)	Oct 25 (Oct 6–Nov 7)
Median wet-season flow magnitude (cfs)	27 (12–52)	18 (7–34)	9 (5–20)
Wet-season baseflow magnitude (cfs)	9 (4–18)	6 (3–13)	3 (1–7)
Wet-season duration (days)	149 (108–184)	140 (87–178)	129 (74–172)
Wet-season start timing	Nov 26 (Nov 7–Dec 10)	Nov 26 (Nov 10–Dec 15)	Dec 2 (Nov 11–Jan 11)
Spring recession start magnitude (cfs)	78 (26–244)	62 (20–205)	46 (12–161)
Spring recession duration (days)	40 (26–76)	42 (26–72)	48 (27–92)
Spring recession start timing	Apr 16 (Mar 17–May 4)	Apr 15 (Mar 18–May 11)	Apr 2 (Mar 11–May 14)
Spring recession rate of change (%)*	6 (3–10)	6 (3–10)	6 (3–10)
Dry-season baseflow magnitude (cfs)	1 (<1–2)	1 (<1–2)	1 (<1–1)

Dry-season duration (days)	185 (140–234)	176 (136–232)	182 (126–235)
Dry-season start timing	May 24 (May 4–Jun 23)	Jun 1 (May 2–Jun 24)	May 31 (Apr 24–Jul 9)

Table D-6. Predicted peak functional flow metrics for Seely Creek by yearly intervals. Values represent median predictions with 10th–90th percentile ranges in parentheses. Peak flows may not occur every year. Data from the Natural Flows Database, COMID 8285210 (California Environmental Flows Working Group 2020).

Functional Flow Metric	**All Years**
2-year peak flow magnitude (cfs)	331 (169–452)
2-year peak flow days/year when present	3 (1–19)
2-year peak flow events/year when present	2 (1–5)
5-year peak flow magnitude (cfs)	567 (312–754)
5-year peak flow days/year when present	2 (1–6)
5-year peak flow events/year when present	1 (1–3)
10-year peak flow magnitude (cfs)	635 (267–928)
10-year peak flow days/year when present	2 (1–3)
10-year peak flow events/year when present	1 (1–2)

Table D-7. Predicted functional flow metrics for Miller Creek by water year type. Values represent median predictions within each water year type, with 10th-90th percentile ranges in parentheses. Functional flow metrics with asterisks (*) are not dependent on water year type. Fall pulse flows may not occur every year. Data from the Natural Flows Database, COMID 8285280 (California Environmental Flows Working Group 2020).

Functional Flow Metric	Wet Year	Moderate Year	Dry Year
Fall pulse flow magnitude (cfs)	4 (2–19)	4 (1–13)	3 (1–14)
Fall pulse flow duration (days)*	3 (2–6)	3 (2–6)	3 (2–6)
Fall pulse flow timing	Oct 21 (Oct 6–Nov 3)	Oct 19 (Oct 7–Nov 8)	Oct 25 (Oct 6–Nov 10)
Median wet-season flow magnitude (cfs)	24 (13–37)	15 (8–30)	9 (4–15)
Wet-season baseflow magnitude (cfs)	7 (3–14)	5 (3–10)	2 (1–5)
Wet-season duration (days)	149 (94–178)	137 (77–173)	126 (71–165)
Wet-season start timing	Nov 24 (Nov 7–Dec 11)	Nov 27 (Nov 12–Dec 15)	Dec 8 (Nov 13–Jan 8)
Spring recession start magnitude (cfs)	56 (19–169)	38 (14–132)	35 (8–110)
Spring recession duration (days)	43 (28–104)	47 (30–103)	51 (30–108)
Spring recession start timing	Apr 16 (Mar 7–May 2)	Apr 11 (Mar 9–May 3)	Apr 8 (Mar 12–May 10)
Spring recession rate of change (%)*	6 (3–10)	6 (3–10)	6 (3–10)
Dry-season baseflow magnitude (cfs)	1 (<1–1)	1 (<1–1)	<1 (<1–1)

Functional Flow Metric	Wet Year	Moderate Year	Dry Year
Dry-season duration (days)	181 (129–230)	174 (131–226)	176 (122–227)
Dry-season start timing	May 27 (May 4–Jun 27)	Jun 1 (May 6–Jun 29)	Jun 5 (Apr 24–Jul 16)

Table D-8. Predicted peak functional flow metrics for Miller Creek by yearly intervals. Values represent median predictions with 10th–90th percentile ranges in parentheses. Peak flows may not occur every year. Data from the Natural Flows Database, COMID 8285280 (California Environmental Flows Working Group 2020).

Functional Flow Metric	All Years
2-year peak flow magnitude (cfs)	233 (190–338)
2-year peak flow days/year when present	3 (1–19)
2-year peak flow events/year when present	2 (1–5)
5-year peak flow magnitude (cfs)	356 (320–478)
5-year peak flow days/year when present	2 (1–6)
5-year peak flow events/year when present	1 (1–3)
10-year peak flow magnitude (cfs)	460 (391–582)
10-year peak flow days/year when present	2 (1–3)
10-year peak flow events/year when present	1 (1–2)

Table D-9. Predicted functional flow metrics for Lower China Creek by water year type. Values represent median predictions within each water year type, with 10th-90th percentile ranges in parentheses. Functional flow metrics with asterisks (*) are not dependent on water year type. Fall pulse flows may not occur every year. Data from the Natural Flows Database, COMID 8285306 (California Environmental Flows Working Group 2020).

Functional Flow Metric	Wet Year	Moderate Year	Dry Year
Fall pulse flow magnitude (cfs)	5 (2–21)	4 (1–15)	3 (1–15)
Fall pulse flow duration (days)*	3 (2–6)	3 (2–6)	3 (2–6)
Fall pulse flow timing	Oct 21 (Oct 7–Nov 1)	Oct 20 (Oct 8–Nov 10)	Oct 25 (Oct 7–Nov 4)
Median wet-season flow magnitude (cfs)	26 (12–39)	17 (8–32)	10 (5–17)
Wet-season baseflow magnitude (cfs)	8 (3–14)	6 (3–11)	3 (1–6)
Wet-season duration (days)	149 (99–179)	136 (84–172)	128 (76–167)
Wet-season start timing	Nov 22 (Nov 8–Dec 10)	Nov 27 (Nov 12–Dec 15)	Nov 30 (Nov 7–Jan 5)
Spring recession start magnitude (cfs)	60 (21–186)	41 (16–136)	37 (10–103)
Spring recession duration (days)	42 (26–74)	45 (28–78)	48 (30–93)
Spring recession start timing	Apr 15 (Mar 17–May 2)	Apr 13 (Mar 13–May 3)	Apr 3 (Mar 12–May 8)
Spring recession rate of change (%)*	6 (3–10)	6 (3–10)	6 (3–10)
Dry-season baseflow magnitude (cfs)	1 (<1–2)	1 (<1–2)	1 (<1–2)

Functional Flow Metric	Wet Year	Moderate Year	Dry Year
Dry-season duration (days)	179 (125–230)	173 (125–222)	177 (119–226)
Dry-season start timing	May 26 (May 5–Jun 21)	Jun 1 (May 6–Jun 22)	May 31 (Apr 24–Jul 4)

Table D-10. Predicted peak functional flow metrics for Lower China Creek by yearly intervals. Values represent median predictions with 10th–90th percentile ranges in parentheses. Peak flows may not occur every year. Data from the Natural Flows Database, COMID 8285306 (California Environmental Flows Working Group 2020).

Functional Flow Metric	All Years
2-year peak flow magnitude (cfs)	267 (205–362)
2-year peak flow days/year when present	3 (1–19)
2-year peak flow events/year when present	2 (1–5)
5-year peak flow magnitude (cfs)	381 (372–513)
5-year peak flow days/year when present	2 (1–6)
5-year peak flow events/year when present	1 (1–3)
10-year peak flow magnitude (cfs)	493 (438–624)
10-year peak flow days/year when present	2 (1–3)
10-year peak flow events/year when present	1 (1–2)

Table D-11. Predicted functional flow metrics for Upper China Creek by water year type. Values represent median predictions within each water year type, with 10th-90th percentile ranges in parentheses. Functional flow metrics with asterisks (*) are not dependent on water year type. Fall pulse flows may not occur every year. Fall pulse flow duration and spring recession rate of change and were not estimated for this and other very small drainages. Data from the Natural Flows Database, COMID 8285284 (California Environmental Flows Working Group 2020).

Functional Flow Metric	Wet Year	Moderate Year	Dry Year
Fall pulse flow magnitude (cfs)	1 (<1–3)	1 (<1–2)	1 (<1–2)
Fall pulse flow duration (days)*	–	–	–
Fall pulse flow timing	Oct 22 (Oct 7–Nov 3)	Oct 21 (Oct 7–Nov 12)	Oct 25 (Oct 9–Nov 12)
Median wet-season flow magnitude (cfs)	5 (2–7)	3 (1–5)	2 (1–3)
Wet-season baseflow magnitude (cfs)	1 (1–2)	1 (1–2)	<1 (<1–1)
Wet-season duration (days)	149 (96–179)	138 (86–175)	128 (76–165)
Wet-season start timing	Nov 22 (Nov 7–Dec 11)	Nov 25 (Nov 11–Dec 15)	Nov 29 (Nov 9–Jan 3)
Spring recession start magnitude (cfs)	10 (4–32)	7 (3–24)	6 (2–20)
Spring recession duration (days)	42 (27–81)	45 (29–84)	49 (30–98)
Spring recession start timing	Apr 16 (Mar 14–May 4)	Apr 14 (Mar 12–May 8)	Apr 3 (Mar 11–May 11)
Spring recession rate of change (%)*	–	–	–
Dry-season baseflow magnitude (cfs)	<1 (<1–<1)	<1 (<1–<1)	<1 (<1–<1)

Functional Flow Metric	Wet Year	Moderate Year	Dry Year
Dry-season duration (days)	176 (99–229)	171 (93–222)	173 (101–226)
Dry-season start timing	May 26 (May 5–Jun 24)	Jun 1 (May 7–Jun 25)	Jun 4 (Apr 24–Jul 7)

Table D-12. Predicted peak functional flow metrics for Upper China Creek by yearly intervals. Values represent median predictions with 10th–90th percentile ranges in parentheses. Peak flows may not occur every year. Duration and frequency of peak flows were not estimated for this and other very small drainages. Data from the Natural Flows Database, COMID 8285284 (California Environmental Flows Working Group 2020).

Functional Flow Metric	All Years
2-year peak flow magnitude (cfs)	47 (36–64)
2-year peak flow days/year when present	–
2-year peak flow events/year when present	–
5-year peak flow magnitude (cfs)	67 (65–90)
5-year peak flow days/year when present	–
5-year peak flow events/year when present	–
10-year peak flow magnitude (cfs)	86 (77–109)
10-year peak flow days/year when present	–
10-year peak flow events/year when present	–

Table D-13. Predicted functional flow metrics for North Fork China Creek by water year type. Values represent median predictions within each water year type, with 10th-90th percentile ranges in parentheses. Functional flow metrics with asterisks (*) are not dependent on water year type. Fall pulse flows may not occur every year. Fall pulse flow duration and spring recession rate of change were not estimated for this and other very small drainages. Data from the Natural Flows Database, COMID 8285274.

Functional Flow Metric	Wet Year	Moderate Year	Dry Year
Fall pulse flow magnitude (cfs)	1 (<1–6)	1 (<1–4)	1 (<1–3)
Fall pulse flow duration (days)*	–	–	–
Fall pulse flow timing	Oct 21 (Oct 6–Nov 2)	Oct 19 (Oct 7–Nov 12)	Oct 25 (Oct 7–Nov 9)
Median wet-season flow magnitude (cfs)	7 (3–11)	5 (2–9)	3 (1–4)
Wet-season baseflow magnitude (cfs)	2 (1–4)	2 (1–3)	1 (<1–2)
Wet-season duration (days)	149 (101–178)	139 (88–173)	129 (75–165)
Wet-season start timing	Nov 22 (Nov 8–Dec 10)	Nov 27 (Nov 12–Dec 14)	Dec 5 (Nov 12–Jan 8)
Spring recession start magnitude (cfs)	17 (6–50)	11 (4–37)	10 (3–29)
Spring recession duration (days)	40 (26–68)	44 (27–72)	47 (28–94)
Spring recession start timing	Apr 16 (Mar 13–May 5)	Apr 12 (Mar 11–May 6)	Apr 6 (Mar 14–May 10)
Spring recession rate of change (%)*	–	–	–
Dry-season baseflow magnitude (cfs)	<1 (<1–1)	<1 (<1–1)	<1 (<1–1)

Functional Flow Metric	Wet Year	Moderate Year	Dry Year
Dry-season duration (days)	177 (105–231)	172 (101–225)	174 (103–229)
Dry-season start timing	May 26 (May 2–Jun 22)	Jun 1 (May 5–Jun 22)	Jun 4 (Apr 24–Jul 7)

Table D-14. Predicted peak functional flow metrics for North Fork China Creek by yearly intervals. Values represent median predictions with 10th–90th percentile ranges in parentheses. Peak flows may not occur every year. Duration and frequency of peak flows were not estimated for this and other very small drainages. Data from the Natural Flows Database, COMID 8285274 (California Environmental Flows Working Group 2020).

Functional Flow Metric	All Years
2-year peak flow magnitude (cfs)	70 (57–102)
2-year peak flow days/year when present	–
2-year peak flow events/year when present	–
5-year peak flow magnitude (cfs)	107 (105–144)
5-year peak flow days/year when present	–
5-year peak flow events/year when present	–
10-year peak flow magnitude (cfs)	138 (135–175)
10-year peak flow days/year when present	–
10-year peak flow events/year when present	–

Table D-15. Predicted functional flow metrics for Dinner Creek by water year type. Values represent median predictions within each water year type, with 10th-90th percentile ranges in parentheses. Functional flow metrics with asterisks (*) are not dependent on water year type. Fall pulse flows may not occur every year. Fall pulse flow duration and spring recession rate of change were not estimated for this and other very small drainages. Data from the Natural Flows Database, COMID 8285312 (California Environmental Flows Working Group 2020).

Functional Flow Metric	Wet Year	Moderate Year	Dry Year
Fall pulse flow magnitude (cfs)	2 (1–8)	2 (1–5)	1 (<1–6)
Fall pulse flow duration (days)*	–	–	–
Fall pulse flow timing	Oct 21 (Oct 7–Oct 31)	Oct 21 (Oct 8–Nov 10)	Oct 25 (Oct 8–Nov 6)
Median wet-season flow magnitude (cfs)	10 (4–15)	6 (3–11)	4 (2–6)
Wet-season baseflow magnitude (cfs)	3 (1–5)	2 (1–4)	1 (<1–2)
Wet-season duration (days)	149 (97–179)	139 (86–172)	129 (76–164)
Wet-season start timing	Nov 21 (Nov 7–Dec 10)	Nov 26 (Nov 13–Dec 16)	Nov 28 (Nov 7–Dec 30)
Spring recession start magnitude (cfs)	22 (8–69)	16 (6–52)	13 (4–39)
Spring recession duration (days)	43 (28–102)	46 (30–101)	50 (30–106)
Spring recession start timing	Apr 16 (Mar 21–May 3)	Apr 14 (Mar 13–May 6)	Apr 1 (Mar 10–May 6)
Spring recession rate of change (%)*	–	–	–
Dry-season baseflow magnitude (cfs)	<1 (<1–1)	<1 (<1–1)	<1 (<1–1)

Functional Flow Metric	Wet Year	Moderate Year	Dry Year
Dry-season duration (days)	177 (108–229)	171 (106–221)	178 (105–227)
Dry-season start timing	May 27 (May 6–Jun 22)	Jun 1 (May 7–Jun 25)	May 30 (Apr 24–Jul 6)

Table D-16. Predicted peak functional flow metrics for Dinner Creek by yearly intervals. Values represent median predictions with 10th–90th percentile ranges in parentheses. Peak flows may not occur every year. Duration and frequency of peak flows were not estimated for this and other very small drainages. Data from the Natural Flows Database, COMID 8285312 (California Environmental Flows Working Group 2020).

Functional Flow Metric	All Years
2-year peak flow magnitude (cfs)	98 (75–138)
2-year peak flow days/year when present	–
2-year peak flow events/year when present	–
5-year peak flow magnitude (cfs)	141 (137–218)
5-year peak flow days/year when present	–
5-year peak flow events/year when present	–
10-year peak flow magnitude (cfs)	182 (162–230)
10-year peak flow days/year when present	–
10-year peak flow events/year when present	–

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