



Klamath River Outmigrant Monitoring – 2013 Season Summary

Synopsis: The outmigration of juvenile salmonids is monitored annually on the main stem Klamath River by the USFWS Arcata Fish and Wildlife Office (AFWO) and the Karuk Tribe of California. The objectives of this collaborative project are to:

1. Estimate the weekly abundance of juvenile Chinook salmon and collect pertinent biological data such as fork lengths and presence of clinical signs of disease at three selected locations on the main-stem Klamath River.
2. Collect, preserve, and deliver weekly-stratified, random samples of young-of-the-year Chinook salmon to the Service's California-Nevada Fish Health Center for conducting QPCR assays to estimate infection rates in the outmigrant population.
3. Collect relative abundance and biological data on coho salmon and steelhead at the three locations on the main stem Klamath River.

Information generated by this study are used for a variety of purposes, including stock recruitment analyses, to inform flow management decisions, to further develop a fish disease model, and to validate and calibrate the S³ (Stream Salmonid Simulator) Chinook salmon production model, among others.

Monitoring this season began on March 5, 2013 at three sites on the main-stem Klamath River located between Iron Gate Dam (IGD; rkm 309.65) and the Scott River confluence (rkm 232.95). The upstream-most site (rkm 307.75), referred to as the “Bogus Trap Site”, was located on the right bank downstream of the Bogus Creek confluence on Blue Heron RV Park property. The second location was the “I-5 Trap Site” (rkm 293.55), which was positioned on the left bank downstream of the Carson Creek confluence and upstream of the I-5 bridge river crossing. The site located furthest downriver was the “Kinsman Trap Site” (rkm 237.55) and was positioned on the left bank just upstream of the Kinsman Creek confluence. Trapping at the Bogus Trap Site was conducted using a single 3.1 m wide and 1.6 m tall frame net. Sampling at the I-5 Trap Site was conducted using two inline 8-ft diameter rotary screw traps (RST) and one 3.1-by-1.6 m frame net. One 5-ft diameter RST was used to capture fish at the Kinsman Trap Site. Traps were typically operated four nights per week (Monday through Thursday) and checked once daily while in operation. Monitoring at the Bogus and I-5 sites ended for the season on May 22 with the initial release of Brood Year 2012 Chinook salmon from Iron Gate Hatchery and concurrent drop in wild fish catch. Monitoring at the Kinsman site concluded on May 31 after most of the wild fish had moved downstream of the study area.

Supplemental migration timing and magnitude and fish size data were also collected by weekly depletion seining at the Klamathon/Copco-Ager Bridge crossing (Klamathon Site, rkm 300.70). Seine catch numbers are not reported in this summary but fish sizes and disease observations are included.

This project summary provides an in-season account of the mean catch per day by week (Table 1) of Chinook and coho salmon and steelhead at each trap site. In addition, we provided weekly estimates of the mean fork length of young-of-the-year (YOY) Chinook and coho salmon from the each of the three trap sites and the Klamathon seine site (Table 2). Expansions to generate weekly-stratified abundance estimates are not presented here and instead, are calculated after the trapping season concludes.

Included in this project summary is a weekly-stratified account of clinical signs of disease observed in the catch for the three trap and single seine sample sites (Table 3). Note that these data are based on the visual presence of external symptoms of disease, which may not always be revealed by infected fish. The percentage of live YOY Chinook salmon in the trap and seine catches that exhibit distended bellies, gill fungus, and pale gills are presented separately for each site on a weekly basis (Table 3). Distended bellies may be a clinical sign of infection by the myxosporean parasites, *Ceratomyxa shasta* and *Parvicapsula minibicornis*. Gills of juvenile salmonids ≥ 45 mm FL were evaluated for color (red, pale/pink, white, or tan) and condition (normal, eroded, or fungal). Pale gills may be due to anemia associated with *P. minibicornis* infection. Gill fungus is likely *Saprolegnia* growing upon a columnaris (*Flavobacterium columnare*) infection.

To more accurately determine infection rates for the outmigrant juvenile Chinook salmon population passing the Kinsman Trap Site, weekly-stratified random samples were collected, preserved, and delivered to the Service's California-Nevada Fish Health Center (CA-NV FHC) to process using q-PCR assays. The CA-NV FHC investigates infection rates of *C. shasta*, *P. minibicornis* and other pathogens in juvenile salmonids in the Klamath River annually in the reach between Iron Gate Dam and the estuary. The CA-NV FHC typically releases about two or three in-season updates (which are posted on the AFWO website) and a final report for each season.

We also present daily mean discharge below IGD (Figure 1) and at the Kinsman Trap Site (Figure 2) from March through July 2000 to 2013 to help portray pertinent flow conditions. Flow at the Bogus and I-5 trap sites is represented by USGS Gauging Station 11516530 (Klamath River below IGD, California). Discharge at USGS 11520500 (Klamath River near Seiad Valley, California) minus discharge at USGS 11519500 (Scott River near Fort Jones, California) is used as a surrogate flow for the Kinsman Trap Site.

If you have any questions regarding this summary, please contact Steve Gough at (707) 825-5197 or Bill Pinnix, (707) 825-5129.

Table 1. In-season summary of the average catch per day by week of adipose fin-clipped (AD Clip) and non adipose fin-clipped (No Clip) Chinook salmon and steelhead and left maxillary-clipped (LM Clip) and non-maxillary clipped (No Clip) coho salmon by trap at the Bogus, I-5, and Kinsman trap sites on the main-stem Klamath River, 2013. Note that RST = rotary screw trap, UPS = upstream, DNS = downstream, and YOY = young-of-the-year.

Trap	Survey Week	Sample Dates	Q (cfs) ^a		Water Temp. (F) ^b		Trapping Days	Chinook (<i>O. tshawytscha</i>)			Coho (<i>O. kisutch</i>)			Steelhead (<i>O. mykiss</i>)		
								YOY			Age 1 +			Age 1 +		
			Min	Max	Min	Max		No Clip	AD Clip	Age 1+	YOY	No Clip	LM Clip	YOY	No Clip	AD Clip
Bogus Frame	1	3/6-3/8	1230	1250	39.7	41.1	3	312.67	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00
	2	3/12-3/15	1570	1600	41.5	42.2	4	826.25	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00
	3	3/19-3/22	1660	2170	41.0	45.5	4	759.75	0.00	0.00	0.00	0.00	2.25	0.00	0.50	0.00
	4	3/26-3/29	2200	2430	46.7	47.4	4	841.50	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00
	5	4/2-4/5	1810	2290	48.7	50.5	3	4477.67	0.00	0.00	29.67	0.00	0.00	0.33	1.00	0.00
	6	4/9-4/12	1430	1590	51.4	52.5	4	2663.25	0.00	0.00	40.75	0.00	0.00	0.25	0.00	0.00
	7	4/16-4/19	1430	1670	51.0	52.1	4	1470.75	0.00	0.00	25.00	0.00	0.00	0.00	0.50	0.00
	8	4/23-4/26	1150	1170	53.7	54.5	4	100.50	0.00	0.00	7.25	0.00	0.00	2.25	0.00	0.00
	9	4/30-5/3	1150	1160	55.0	57.7	4	205.25	0.00	0.00	3.00	0.00	0.00	18.25	0.00	0.00
	10	5/7-5/10	1130	1170	57.9	60.9	4	170.75	0.00	0.00	1.75	0.00	0.25	38.25	0.00	0.00
	11	5/14-5/17	1140	1170	62.9	63.6	4	22.00	0.00	0.00	0.00	0.00	0.00	5.25	0.25	0.00
	12	5/21-5/21	1150	1150	59.5	59.5	1	0.00	0.00	0.00	0.00	0.00	0.00	4.00	0.00	0.00
I-5 UPS RST	1	3/7-3/8	1230	1230	39.3	42.4	2	116.50	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00
	2	3/12-3/15	1410	1600	41.7	42.9	2	258.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00
	3	3/19-3/22	1660	2170	42.2	45.8	1	63.00	0.00	0.00	0.00	1.00	6.00	0.00	1.00	0.00
	4	3/26-3/29	2200	2430	45.6	47.1	4	24.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00
	5	4/2-4/5	1810	2290	48.7	50.9	4	88.00	0.00	0.00	0.00	0.00	0.25	0.00	0.50	0.00
	6	4/9-4/12	1430	1590	49.4	51.6	4	166.25	0.00	0.00	0.00	0.25	0.50	0.75	0.50	0.00
	7	4/16-4/19	1430	1670	49.4	52.1	4	215.25	0.00	0.00	0.25	0.00	0.00	0.50	0.75	0.00
	8	4/23-4/26	1150	1170	51.2	53.7	4	55.75	0.00	0.00	0.25	0.00	0.25	0.00	0.50	0.00
	9	4/30-5/3	1150	1160	54.6	56.8	4	57.25	0.00	0.00	0.00	0.00	0.00	0.50	1.00	0.00
	10	5/7-5/10	1130	1170	57.5	60.8	4	38.75	0.00	0.00	1.00	0.25	0.50	1.75	1.25	0.00
	11	5/14-5/17	1140	1170	60.8	61.7	4	41.75	0.00	0.00	0.75	0.00	0.00	0.00	1.75	0.00
	12	5/21-5/22	1150	1150			2	20.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00
I-5 DNS RST	1	3/7-3/8	1230	1230	39.3	42.4	2	41.50	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00
	2	3/12-3/15	1410	1600	41.7	42.9	4	99.75	0.00	0.25	0.00	0.00	0.00	0.00	1.25	0.00
	3	3/19-3/22	1660	2170	42.2	45.8	4	60.00	0.00	0.00	0.00	0.00	8.75	0.00	0.00	0.00
	4	3/26-3/29	2200	2430	45.6	47.1	4	27.75	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.00
	5	4/2-4/5	1810	2290	48.7	50.9	4	66.25	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.00
	6	4/9-4/12	1430	1590	49.4	51.6	4	158.50	0.00	0.00	0.00	0.00	0.00	0.25	0.25	0.00
	7	4/16-4/19	1430	1670	49.4	52.1	4	140.50	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00
	8	4/23-4/26	1150	1170	51.2	53.7	4	33.25	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00
	9	4/30-5/3	1150	1160	54.6	56.8	4	62.00	0.00	0.00	0.00	0.00	0.25	0.50	0.00	0.00
	10	5/7-5/10	1130	1170	57.5	60.8	4	34.50	0.00	0.00	0.00	0.00	0.00	0.75	0.50	0.00
	11	5/14-5/17	1140	1170	60.8	61.7	4	23.25	0.00	0.00	0.00	0.00	0.00	0.50	0.25	0.00
	12	5/21-5/22	1150	1150			2	12.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
I-5 Frame	1	3/8-3/8	1230	1230	39.3	39.3	1	117.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7	4/17-4/19	1430	1620	50.1	52.1	3	177.00	0.00	0.00	3.00	0.00	0.00	0.33	0.00	0.00
	8	4/23-4/26	1150	1170	51.2	53.7	4	10.50	0.00	0.00	0.50	0.00	0.25	0.00	0.00	0.00
	9	4/30-5/3	1150	1160	54.6	56.8	3	9.33	0.00	0.00	0.00	0.00	0.00	4.33	0.00	0.00
	10	5/7-5/10	1130	1170	57.5	60.8	3	2.67	0.00	0.00	0.67	0.00	0.33	0.67	0.00	0.00
	11	5/14-5/17	1140	1170	60.8	61.7	2	5.00	0.00	0.00	0.50	0.00	0.00	1.00	0.00	0.00
Kinsman RST	1	3/8-3/8	2073	2073	42.3	42.3	1	662.00	0.00	1.00	0.00	1.00	0.00	0.00	2.00	0.00
	2	3/12-3/15	1410	2537	45.1	46.0	4	640.50	0.00	0.50	0.00	0.00	0.00	0.00	2.50	0.00
	3	3/19-3/22	2377	3462	43.7	48.6	4	268.50	0.00	0.50	0.00	0.00	3.75	0.00	2.25	0.00
	4	3/26-3/29	3095	3221	48.2	48.9	4	104.25	0.00	0.00	0.00	0.00	0.50	0.00	1.50	0.00
	5	4/2-4/5	3320	3610	49.6	52.7	4	556.75	0.00	0.00	0.00	0.75	0.25	0.00	2.00	0.00
	6	4/9-4/12	2667	2780	50.2	58.8	4	1012.50	0.00	0.00	2.00	0.25	0.50	0.00	2.25	0.00
	7	4/16-4/19	2325	2591	50.5	56.7	4	844.25	0.00	0.25	0.75	0.25	0.25	0.00	2.50	0.00
	8	4/23-4/26	1901	1988	55.0	57.6	4	139.00	0.00	0.00	1.25	0.00	0.00	0.00	3.50	0.00
	9	4/30-5/3	1868	1978	55.4	59.1	4	121.50	0.00	0.00	1.75	0.25	0.00	0.25	3.50	0.00
	10	5/7-5/10	1948	2062	58.6	63.6	4	106.25	0.00	0.00	3.75	0.25	0.25	1.75	5.00	0.00
	11	5/14-5/17	1770	1896	61.5	63.3	4	49.00	0.00	0.00	6.25	0.00	0.00	1.25	5.25	0.00
	12	5/21-5/24	1615	1678	61.0	61.5	4	16.25	0.00	0.00	2.75	0.00	0.00	0.25	3.25	0.00
	13	5/29-5/31	1588	1629	60.9	60.9	3	23.33	1.67	0.00	3.00	0.00	0.00	2.00	6.00	0.00

^a mean daily discharge range during sampling dates (discharge below IGD used for Bogus and I-5 sites; flow at Kinsman Site is Klamath River flow at Seiad minus Scott River flow)

^b temperature recorded at time of trap check (true daily ranges from temperature loggers will become available at the end of the season)

Table 2. In-season summary of fork lengths, compared with the last ten years, of naturally-produced Chinook and coho salmon by trap type at the Bogus, Klamathon, I-5, and Kinsman sites on the main-stem Klamath River, 2013. Note that RST = rotary screw trap and YOY = young-of-the-year.

Site	Calendar Week	2013 sampling dates	YOY Chinook (natural) - fork length data							YOY coho - fork length data								
			2013					Last 10-years		2013					Last 10-years			
			n	Mean (mm)	Min. (mm)	Max. (mm)	% > 55 mm	n	Years of data	Mean (mm)	n	Mean (mm)	Min. (mm)	Max. (mm)	% > 55 mm	n	Years of data	Mean (mm)
Bogus Frame	10	Mar 6-7	60	36.7	34	39	0.0%	120	2	36.5	0	-	-	-	-	0	0	-
	11	Mar 12-14	90	37.4	34	42	0.0%	592	9	37.1	0	-	-	-	-	2	1	34.0
	12	Mar 19-21	90	37.3	35	42	0.0%	968	10	37.4	0	-	-	-	-	159	4	35.3
	13	Mar 26-28	90	37.3	32	42	0.0%	893	9	37.8	0	-	-	-	-	130	5	35.0
	14	Apr 2-3	60	37.0	32	43	0.0%	960	10	37.7	37	34.2	31	36	0.0%	281	9	34.9
	15	Apr 9-11	90	37.3	34	47	0.0%	811	9	38.0	76	34.6	31	39	0.0%	349	9	34.8
	16	Apr 16-18	90	38.4	33	48	0.0%	910	9	38.5	65	35.0	31	38	0.0%	665	9	35.0
	17	Apr 23-25	90	41.0	35	54	0.0%	906	10	40.6	25	34.2	32	44	0.0%	485	10	36.1
	18	Apr 30-May 2	90	40.1	38	68	4.4%	958	10	43.2	10	36.1	34	43	0.0%	499	9	36.8
	19	May 7-9	90	41.9	35	69	3.3%	766	10	44.4	5	38.2	34	49	0.0%	306	8	39.9
	20	May 14-16	71	42.9	37	72	4.2%	634	8	45.4	0	-	-	-	-	174	5	42.1
21	May 21	0	-	-	-	-	244	4	46.1	0	-	-	-	-	20	3	42.2	
Klamathon Seine	11	Mar 14	11	38.4	36	43	0.0%	41	2	40.3	0	-	-	-	-	0	0	-
	12	Mar 20	7	37.1	36	39	0.0%	146	8	38.4	0	-	-	-	-	0	0	-
	13	Mar 28	22	37.6	35	40	0.0%	135	7	40.4	0	-	-	-	-	0	0	-
	14	Apr 4	30	39.9	37	43	0.0%	118	7	40.5	0	-	-	-	-	1	1	42.0
	15	Apr 11	30	42.8	36	50	0.0%	189	7	40.3	0	-	-	-	-	0	0	-
	16	Apr 17	30	44.8	36	62	6.7%	167	7	41.1	0	-	-	-	-	0	0	-
	17	Apr 25	30	47.0	37	62	6.7%	196	9	44.3	0	-	-	-	-	0	0	-
	18	May 2	30	49.5	38	61	13.3%	217	8	48.2	0	-	-	-	-	2	1	46.5
	19	May 9	12	49.2	46	57	8.3%	183	8	48.1	0	-	-	-	-	0	0	-
	20	May 16	30	48.5	38	60	10.0%	245	9	52.9	0	-	-	-	-	3	2	43.5
I-5 RST's	10	Mar 6-7	30	37.8	35	40	0.0%	30	1	37.8	0	-	-	-	-	0	0	-
	11	Mar 12-14	90	37.6	32	41	0.0%	294	8	37.2	0	-	-	-	-	0	0	-
	12	Mar 19-21	90	37.9	35	42	0.0%	362	9	38.2	0	-	-	-	-	0	0	-
	13	Mar 26-28	76	38.1	34	44	0.0%	494	8	37.9	0	-	-	-	-	4	2	37.2
	14	Apr 2-4	90	39.3	35	51	0.0%	559	8	38.5	0	-	-	-	-	8	2	35.3
	15	Apr 9-11	90	43.0	33	55	0.0%	550	8	39.3	0	-	-	-	-	7	4	35.6
	16	Apr 16-18	90	45.2	36	64	8.9%	598	8	40.6	2	33.5	32	35	0.0%	29	7	34.6
	17	Apr 23-25	90	47.6	35	65	14.4%	545	8	43.6	2	33.5	32	35	0.0%	24	6	35.5
	18	Apr 30-May 2	90	47.8	36	71	20.0%	465	8	48.2	0	-	-	-	-	2	2	36.0
	19	May 7-9	90	50.2	37	77	20.0%	505	7	50.3	4	45.3	35	54	0.0%	19	6	43.3
	20	May 14-16	90	57.6	37	91	48.9%	569	7	55.6	3	50.7	42	56	33.3%	36	6	50.3
21	May 21-22	55	69.4	43	97	76.4%	398	7	64.9	0	-	-	-	-	50	4	54.0	
I-5 Frame	11	-	0	-	-	-	-	191	6	37.8	0	-	-	-	-	0	0	-
	12	-	0	-	-	-	-	504	9	37.7	0	-	-	-	-	20	4	34.0
	13	-	0	-	-	-	-	477	8	38.4	0	-	-	-	-	52	6	35.8
	14	-	0	-	-	-	-	510	8	39.0	0	-	-	-	-	69	7	35.3
	15	-	0	-	-	-	-	492	6	39.5	0	-	-	-	-	111	6	35.2
	16	Apr 17-18	60	42.8	35	57	3.3%	623	7	40.7	4	34.3	33	37	0.0%	169	7	35.4
	17	Apr 23-25	40	44.0	34	57	5.0%	461	7	42.8	2	32.5	32	33	0.0%	95	7	35.5
	18	Apr 30-May 2	20	45.5	37	65	10.0%	448	8	43.7	0	-	-	-	-	110	6	39.4
	19	May 7-8	5	39.8	37	46	0.0%	249	8	47.8	1	41.0	41	41	0.0%	48	3	38.2
	20	May 14	9	54.1	42	77	33.3%	224	5	50.9	1	51.0	51	51	0.0%	20	4	47.6
	21	May 21	0	-	-	-	-	111	2	49.0	0	-	-	-	-	2	1	54.5
Kinsman RST	11	Mar 12-14	70	39.6	34	52	0.0%	245	8	39.8	0	-	-	-	-	0	0	-
	12	Mar 19-21	90	42.3	34	56	1.1%	429	9	41.9	0	-	-	-	-	4	2	35.3
	13	Mar 27-28	90	46.3	38	62	8.9%	532	7	44.1	0	-	-	-	-	29	2	36.1
	14	Apr 2-4	90	45.5	32	66	6.7%	623	9	46.6	0	-	-	-	-	43	7	35.8
	15	Apr 9-11	90	48.4	35	70	13.3%	567	9	47.1	7	35.6	34	37	0.0%	46	6	35.3
	16	Apr 16-18	90	52.6	35	73	27.8%	624	9	51.7	0	-	-	-	-	87	5	33.5
	17	Apr 23-25	90	50.5	36	71	15.6%	587	10	52.7	5	38.8	37	42	0.0%	20	5	37.9
	18	Apr 30-May 2	89	55.0	38	82	36.0%	475	8	59.9	6	41.3	34	48	0.0%	24	6	39.8
	19	May 7-9	90	56.6	35	97	53.3%	604	9	59.1	9	47.0	37	57	11.1%	76	8	45.0
	20	May 14-16	90	62.8	36	90	75.6%	634	10	65.5	23	53.8	43	60.0	39.1%	89	8	47.8
	21	May 21-23	52	73.4	39	110	88.5%	493	10	68.8	9	53.0	44	58.0	44.4%	79	6	56.2
	22	May 29-30	0	-	-	-	-	332	6	75.8	5	57.4	53	64.0	60.0%	92	8	54.4

Note: Frame net trapping at the I-5 site was temporarily discontinued Survey Weeks 2 through 6 due to flows too high for the equipment.

Table 3. In-season summary of clinical signs of disease in young-of-the-year Chinook salmon by site at the Bogus, Klamathon, I-5, and Kinsman sites on the main-stem Klamath River, 2013.

Site	Calendar Week	Sampling Dates	Weekly Mean Flow (cfs) ^a	Water Temp. (F) ^b		Belly Condition			Gills				
						Sample Size	Distended		Sample Size	Color		Condition	
				Min	Max		n	%		Pale or Worse	%	Eroded or Fungal	%
Bogus	10	Mar 6-8	1269	39.7	41.1	51	0	0.0%	0	-	-	-	-
	11	Mar 12-14	1541	41.5	42.2	90	0	0.0%	0	-	-	-	-
	12	Mar 19-21	1860	41.0	45.5	90	0	0.0%	0	-	-	-	-
	13	Mar 26-28	2240	46.7	47.1	90	0	0.0%	0	-	-	-	-
	14	Apr 2-3	2066	50.1	50.5	60	0	0.0%	0	-	-	-	-
	15	Apr 9-11	1526	52.1	52.5	90	0	0.0%	2	0	0.0%	0	0.0%
	16	Apr 16-18	1544	51.0	52.1	90	0	0.0%	4	0	0.0%	0	0.0%
	17	Apr 23-25	1171	53.7	54.5	90	0	0.0%	19	1	5.3%	0	0.0%
	18	Apr 30-May 2	1156	55.5	57.7	90	0	0.0%	7	3	42.9%	1	14.3%
	19	May 7-9	1161	57.9	60.9	90	0	0.0%	13	1	7.7%	0	0.0%
	20	May 14-16	1154	62.9	63.6	69	0	0.0%	10	0	0.0%	1	10.0%
Klamathon	21	May 21	1156	59.5	59.5	0	-	-	0	-	-	-	-
	11	Mar 14	1541	42.8	42.8	11	0	0.0%	0	-	-	-	-
	12	Mar 20	1860	42.0	42.0	7	0	0.0%	0	-	-	-	-
	13	Mar 28	2240	48.2	48.2	22	0	0.0%	0	-	-	-	-
	14	Apr 4	2066	-	-	30	0	0.0%	0	-	-	-	-
	15	Apr 11	1526	53.0	53.0	30	0	0.0%	10	0	0.0%	0	0.0%
	16	Apr 17	1544	53.7	53.7	30	0	0.0%	12	0	0.0%	0	0.0%
	17	Apr 25	1171	55.5	55.5	30	0	0.0%	19	0	0.0%	0	0.0%
	18	May 2	1156	55.7	55.7	30	0	0.0%	24	0	0.0%	0	0.0%
	19	May 9	1161	60.9	60.9	12	0	0.0%	12	1	8.3%	0	0.0%
	20	May 16	1154	62.6	62.6	30	0	0.0%	23	0	0.0%	1	4.3%
I-5	10	Mar 7-8	1269	39.3	42.4	30	0	0.0%	0	-	-	-	-
	11	Mar 12-14	1541	41.7	42.9	89	0	0.0%	0	-	-	-	-
	12	Mar 19-21	1860	42.2	45.8	90	0	0.0%	0	-	-	-	-
	13	Mar 26-28	2240	45.6	47.1	72	0	0.0%	0	-	-	-	-
	14	Apr 2-4	2066	48.7	50.9	90	0	0.0%	9	0	0.0%	0	0.0%
	15	Apr 9-11	1526	49.4	49.6	90	0	0.0%	35	0	0.0%	0	0.0%
	16	Apr 16-18	1544	49.4	50.3	150	0	0.0%	56	0	0.0%	1	1.8%
	17	Apr 23-25	1171	51.2	51.6	117	0	0.0%	74	0	0.0%	2	2.7%
	18	Apr 30-May 2	1156	54.6	56.8	109	0	0.0%	59	0	0.0%	1	1.7%
	19	May 7-9	1161	57.5	59.1	95	0	0.0%	61	0	0.0%	1	1.6%
	20	May 14-16	1154	61.3	61.7	95	0	0.0%	80	1	1.3%	1	1.3%
Kinsman	21	May 21-22	1156	-	-	26	0	0.0%	26	0	0.0%	0	0.0%
	10	Mar 8	2114	42.3	42.3	0	-	-	0	-	-	-	-
	11	Mar 12-14	2366	45.1	46.0	68	0	0.0%	10	0	0.0%	0	0.0%
	12	Mar 19-21	2798	43.8	48.6	90	0	0.0%	27	0	0.0%	0	0.0%
	13	Mar 26-28	3045	48.7	48.9	90	0	0.0%	47	0	0.0%	0	0.0%
	14	Apr 2-4	3410	51.3	52.7	90	0	0.0%	45	0	0.0%	0	0.0%
	15	Apr 9-11	2831	50.2	58.8	90	0	0.0%	64	0	0.0%	0	0.0%
	16	Apr 16-18	2481	50.5	56.7	90	0	0.0%	84	0	0.0%	0	0.0%
	17	Apr 23-25	1966	55.0	57.6	90	0	0.0%	81	6	7.4%	1	1.2%
	18	Apr 30-May 2	1929	55.4	56.3	90	0	0.0%	89	7	7.9%	0	0.0%
	19	May 7-9	1965	58.6	60.3	90	2	2.2%	89	25	28.1%	3	3.4%
	20	May 14-16	1854	61.5	63.3	90	2	2.2%	89	37	41.6%	2	2.2%
	21	May 21-23	1656	61.0	61.5	47	1	2.1%	46	15	32.6%	0	0.0%
	22	May 29-30	1603	-	-	44	0	0.0%	43	1	2.3%	0	0.0%

^a discharge below IGD used for Bogus, Klamathon, and I-5 sites; flow at Kinsman Site is Klamath River flow at Seiad minus Scott River flow^b temperature recorded at time of trap check/seine (true daily ranges from temperature loggers will become available at the end of the season)

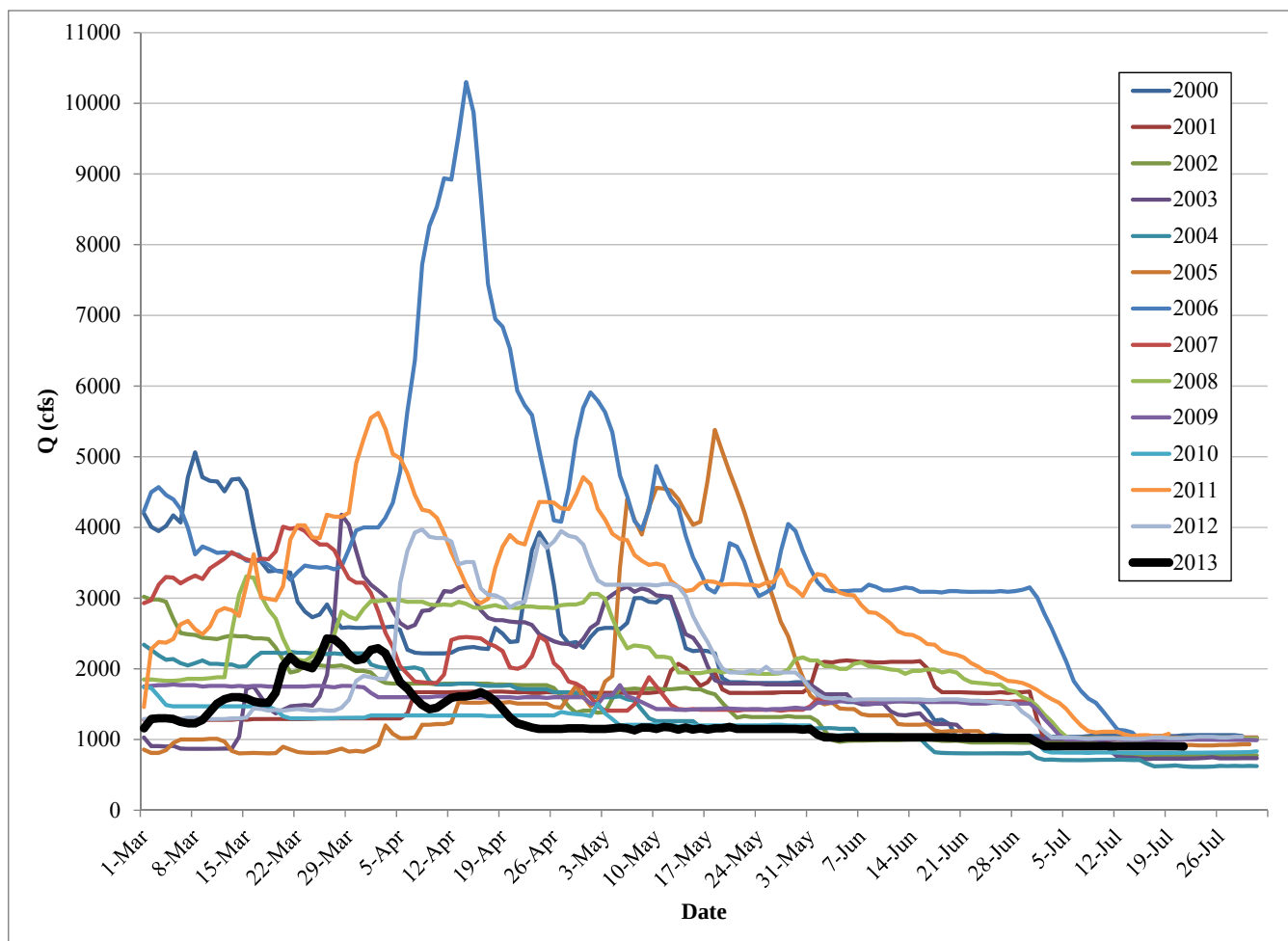


Figure 1. Daily mean discharge below Iron Gate Dam, Klamath River (USGS Gaging Station 11516530) from March through July, 2000 to 2013.

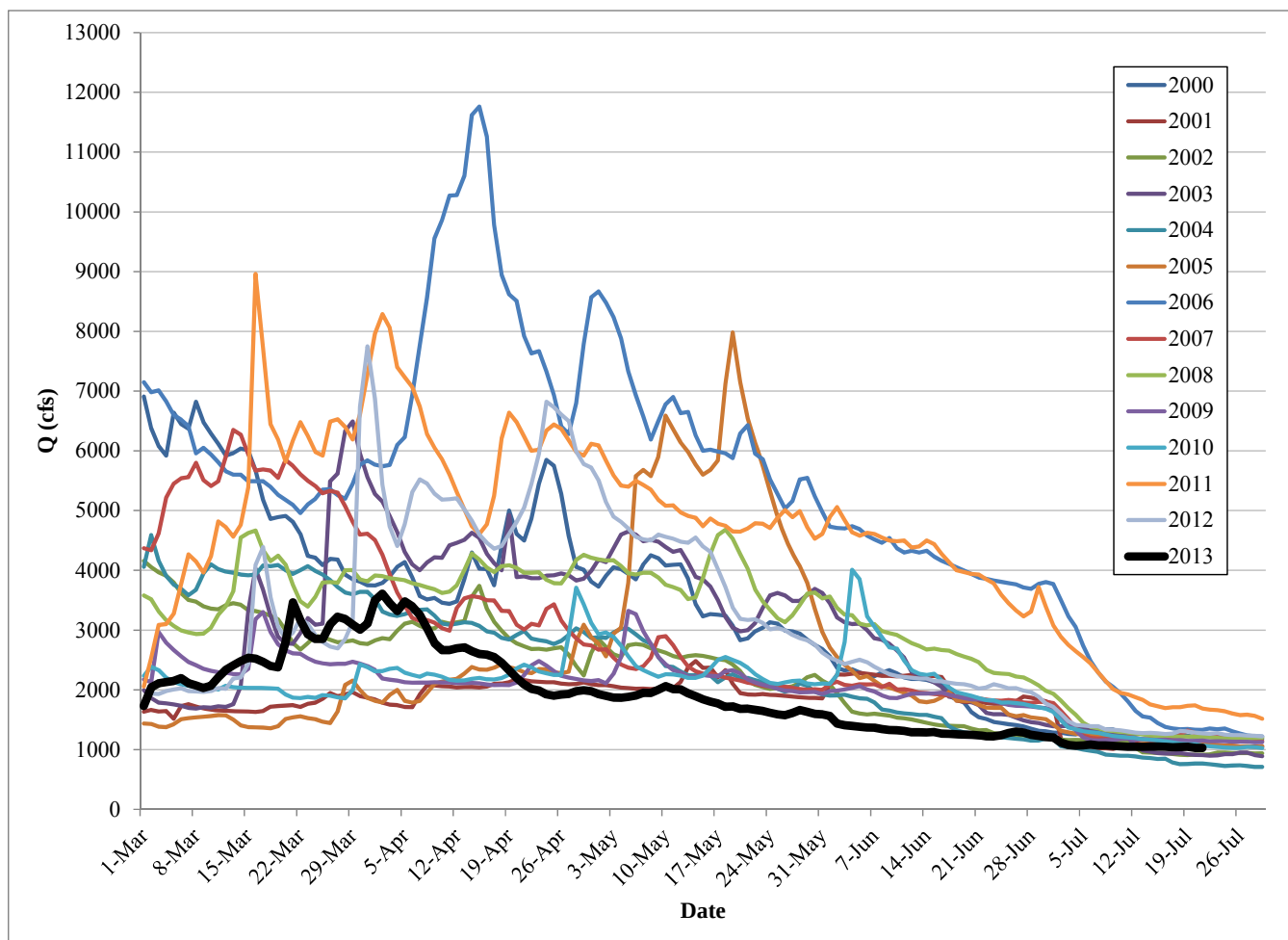


Figure 2. Klamath River daily mean discharge at the Kinsman Trap Site from March through July, 2000 to 2013. Flow measurements are not available at this location. Therefore Klamath River flow near Seiad Valley, CA (USGS Gaging Station 11520500) minus flow from the Scott River near Fort Jones, CA (USGS 11511950) is used as a surrogate.