



Klamath River Outmigrant Monitoring Summary — 2017

Synopsis: The outmigration of juvenile salmonids is monitored annually on the mainstem 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 mainstem Klamath River.
2. Collect, preserve, and deliver weekly-stratified, random samples of young-of-the-year (YOY) Chinook Salmon to the Service's California–Nevada Fish Health Center (CA–NV FHC) 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 mainstem 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 refine a fish disease model, and to validate and calibrate the S³ (Stream Salmonid Simulator) Chinook Salmon production model, among others.

Monitoring was conducted at three sites on the mainstem Klamath River 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-m 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.

Trapping at the Bogus site began February 28 [Calendar Week (CW) 9] but trapping at this site was suspended during CW 11–13 due to high flows coming out of IGD. Trapping at the I-5 site began February 22 (CW 8) with just the frame net. RST trapping began March 9 (CW 10) at this site. The frame net was only in operation for one week before being suspended due to high flows and RST operation was suspended CW 11–13 for this reason. Trapping at the Bogus and I-5 sites concluded on May 26 (CW 21) when Iron Gate Hatchery released their Brood Year 2016 Chinook Salmon smolts. The Kinsman site RST was installed May 31 (CW 22), which is much later than previous seasons due to high flows, and was in operation until the end of June.

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

This project update provides an in-season summary of the total catch (Table 1) and mean catch per day by week (Table 2) of Chinook Salmon, Coho Salmon, and steelhead at each trap site. In addition, we provided weekly estimates of the mean fork length of YOY Chinook and Coho salmon from the each of the three trap sites and the Klamathon Seine Site (Table 3). Expansions to generate weekly-stratified abundance estimates are calculated after the end of the season and are not presented here.

Included in this project summary is a weekly-stratified summary of clinical signs of disease observed in the catch for the trap and seine sites (Table 4). 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 4). Distended bellies may be a clinical sign of infection by the myxosporean parasites, *Ceratonova shasta* and *Parvicapsula minibicornis*. Gills of juvenile salmonids ≥ 45 mm FL are 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 are collected, preserved, and delivered to the CA–NV FHC to process using qPCR assays. This season’s sampling began the week of March 27. The CA–NV FHC investigates infection rates of *C. shasta*, *P. minibicornis* and other pathogens in juvenile salmonids in the Klamath River annually. 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 late February through July 2000–2017 to help portray pertinent flow conditions. Flow at the Bogus and I-5 trap sites are 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 total catch 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 mainstem Klamath River, 2017. Note that RST = rotary screw trap, UPS = upstream, DNS = downstream, and YOY = young-of-the-year.

Preliminary Data - Subject to Revision

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>)				
			Min	Max	Min	Max		YOY			Age 1+			Age 1+				
								No clip	AD clip	Age 1+	YOY	No clip	LM clip	YOY	No clip	AD clip		
Bogus frame	2	2/28-3/2	3000	4820	41.5	41.9	3	3	0	0	0	0	0	0	0	0	0	
	3	3/8-3/10	2980	3670	41.3	41.5	3	8	0	0	0	0	0	0	0	2	0	
	7	4/5-4/7	3830	4260	49.6	50.5	2	11	0	0	0	0	0	0	0	0	0	
	8	4/11-4/12	5257	5760	52.8	53.4	2	3	0	0	4	0	0	0	0	0	0	
	9	4/19-4/21	4320	4930	53.4	54.5	3	6	0	0	1	0	0	0	0	0	0	
	10	4/25-4/28	3200	3520	55.0	55.7	4	11	0	0	6	0	0	0	0	1	0	
	11	5/2-5/5	3100	3500	57.7	61.8	4	13	0	0	3	0	0	2	0	0	0	
	12	5/9-5/12	2920	3210	60.6	61.7	4	4	0	0	0	0	0	5	1	0	0	
	13	5/15-5/18	3050	3200	61.3	62.2	4	1	0	0	1	0	0	10	1	0	0	
	14	5/23-5/25	2560	2600	64.7	65.4	3	5	0	0	1	0	0	12	1	0	0	
	I-5 UPSRST	3	3/9-3/10	3360	3670	41.0	41.1	2	20	0	0	1	0	0	0	5	0	0
		4	3/14-3/14	6890	6890	42.4	42.4	1	13	0	0	1	0	0	0	1	0	0
		7	4/4-4/7	3830	5060	49.2	50.1	4	22	0	0	0	0	2	0	2	0	0
		8	4/11-4/12	5257	5760	52.8	53.2	2	4	0	0	1	0	0	0	0	0	0
9		4/19-4/21	4320	4930	52.8	55.0	3	34	0	0	2	0	0	1	1	0	0	
10		4/25-4/28	3200	3520	54.6	55.9	4	43	0	0	3	0	0	0	2	0	0	
11		5/2-5/5	3100	3500	58.6	61.3	4	141	0	0	2	1	1	4	1	0	0	
12		5/9-5/12	2920	3210	60.6	61.7	4	7	0	0	0	0	0	0	3	0	0	
13		5/16-5/19	2840	3200	60.2	62.2	4	0	0	0	0	0	0	3	4	0	0	
14		5/23-5/25	2560	2600	64.7	66.3	3	6	0	0	1	0	0	0	7	0	0	
I-5 DNSRST		3	3/9-3/10	3360	3670	41.0	41.9	2	8	0	0	0	0	0	0	4	0	0
		4	3/14-3/14	6890	6890	42.4	42.4	1	4	0	0	0	0	0	0	0	0	0
		7	4/4-4/7	3830	5060	49.2	50.1	4	20	0	0	0	0	6	0	4	0	0
		8	4/11-4/12	5257	5760	52.8	53.2	2	0	0	0	2	0	0	0	0	0	0
	9	4/19-4/21	4320	4930	52.6	55.0	3	35	0	0	0	1	0	0	6	0	0	
	10	4/25-4/28	3200	3520	54.6	55.9	4	33	0	0	1	0	0	0	0	0	0	
	11	5/2-5/5	3100	3500	58.6	61.3	4	133	0	0	1	0	0	1	0	0	0	
	12	5/9-5/12	2920	3210	60.6	61.7	4	8	0	0	1	1	0	2	1	0	0	
	13	5/16-5/19	2840	3200	60.2	62.2	4	6	0	0	0	0	2	1	2	0	0	
	14	5/23-5/25	2560.0	2600	64.7	66.3	3	6	0	0	0	0	0	3	3	0	0	
	I-5 frame	1	2/22-2/22	4770	4770	41.9	41.9	1	0	0	0	0	0	0	0	0	0	0
	Kinsman RST	15	6/1-6/2	4180	4590	64.4	66.0	1	46	0	0	1	0	0	1	10	0	0
		16	6/6-6/9	3470	3970	63.1	67.4	1	66	0	0	1	0	0	0	7	0	0
		17	6/13-6/16	3014	3784	62.9	66.5	3	166	20	0	3	0	0	10	30	0	0
18		6/20-6/23	2156	2555	70.1	71.3	4	54	10	0	4	0	0	6	18	0	0	
19		6/27-6/30	1754	1937	70.7	71.6	4	10	1	0	1	0	0	0	11	0	0	

Due to high flows the Bogus frame net was not operated survey weeks 4–6, the I-5 screw traps were only operated one day in survey week 4 and not operated survey weeks 5 and 6, the I-5 frame net was only operated for one day in survey week 1, and the Kinsman screw trap has not yet been installed.



Table 2. In-season summary of the average catch-per-day by week of non adipose fin-clipped (No Clip) and adipose fin-clipped (AD Clip) Chinook Salmon and steelhead and non-maxillary clipped (No Clip) and left maxillary-clipped (LM Clip) Coho Salmon by trap at the Bogus, I-5, and Kinsman trap sites on the mainstem Klamath River, 2017. Note that RST = rotary screw trap, UPS = upstream, DNS = downstream, and YOY = young-of-the-year.

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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>)			
			Min	Max	Min	Max		YOY			Age 1 +			Age 1 +			
								No clip	AD clip	Age 1+	YOY	No clip	LM clip	YOY	No clip	AD clip	
Bogus frame	2	2/28-3/2	3000	4820	41.5	41.9	3	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3	3/8-3/10	2980	3670	41.3	41.5	3	2.67	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	
	7	4/5-4/7	3830	4260	49.6	50.5	2	5.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	8	4/11-4/12	5257	5760	52.8	53.4	2	1.50	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	
	9	4/19-4/21	4320	4930	53.4	54.5	3	2.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	
	10	4/25-4/28	3200	3520	55.0	55.7	4	2.75	0.00	0.00	1.50	0.00	0.00	0.00	0.25	0.00	
	11	5/2-5/5	3100	3500	57.7	61.8	4	3.25	0.00	0.00	0.75	0.00	0.00	0.50	0.00	0.00	
	12	5/9-5/12	2920	3210	60.6	61.7	4	1.00	0.00	0.00	0.00	0.00	0.00	1.25	0.25	0.00	
	13	5/15-5/18	3050	3200	61.3	62.2	4	0.25	0.00	0.00	0.25	0.00	0.00	2.50	0.25	0.00	
	14	5/23-5/25	2560	2600	64.7	65.4	3	1.67	0.00	0.00	0.33	0.00	0.00	4.00	0.33	0.00	
	I-5 UPS RST	3	3/9-3/10	3360	3670	41.0	41.1	2	10.00	0.00	0.00	0.50	0.00	0.00	0.00	2.50	0.00
		4	3/14-3/14	6890	6890	42.4	42.4	1	13.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00
		7	4/4-4/7	3830	5060	49.2	50.1	4	5.50	0.00	0.00	0.00	0.00	0.50	0.00	0.50	0.00
		8	4/11-4/12	5257	5760	52.8	53.2	2	2.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00
9		4/19-4/21	4320	4930	52.8	55.0	3	11.33	0.00	0.00	0.67	0.00	0.00	0.33	0.33	0.00	
10		4/25-4/28	3200	3520	54.6	55.9	4	10.75	0.00	0.00	0.75	0.00	0.00	0.00	0.50	0.00	
11		5/2-5/5	3100	3500	58.6	61.3	4	35.25	0.00	0.00	0.50	0.25	0.25	1.00	0.25	0.00	
12		5/9-5/12	2920	3210	60.6	61.7	4	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00	
13		5/16-5/19	2840	3200	60.2	62.2	4	0.00	0.00	0.00	0.00	0.00	0.00	0.75	1.00	0.00	
14		5/23-5/25	2560	2600	64.7	66.3	3	2.00	0.00	0.00	0.33	0.00	0.00	0.00	2.33	0.00	
I-5 DNS RST		3	3/9-3/10	3360	3670	41.0	41.9	2	4.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00
		4	3/14-3/14	6890	6890	42.4	42.4	1	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		7	4/4-4/7	3830	5060	49.2	50.1	4	5.00	0.00	0.00	0.00	0.00	1.50	0.00	1.00	0.00
		8	4/11-4/12	5257	5760	52.8	53.2	2	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
	9	4/19-4/21	4320	4930	52.6	55.0	3	11.67	0.00	0.00	0.00	0.33	0.00	0.00	2.00	0.00	
	10	4/25-4/28	3200	3520	54.6	55.9	4	8.25	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	
	11	5/2-5/5	3100	3500	58.6	61.3	4	33.25	0.00	0.00	0.25	0.00	0.00	0.25	0.00	0.00	
	12	5/9-5/12	2920	3210	60.6	61.7	4	2.00	0.00	0.00	0.25	0.25	0.00	0.50	0.25	0.00	
	13	5/16-5/19	2840	3200	60.2	62.2	4	1.50	0.00	0.00	0.00	0.00	0.50	0.25	0.50	0.00	
	14	5/23-5/25	2560.0	2600	64.7	66.3	3	2.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	
	I-5 frame	1	2/22-2/22	4770	4770	41.9	41.9	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Kinsman RST	15	6/1-6/2	4180	4590	64.4	66.0	1	46.00	0.00	0.00	1.00	0.00	0.00	1.00	10.00	0.00
		16	6/6-6/9	3470	3970	63.1	67.4	1	66.00	0.00	0.00	1.00	0.00	0.00	0.00	7.00	0.00
		17	6/13-6/16	3014	3784	62.9	66.5	3	55.33	6.67	0.00	1.00	0.00	0.00	3.33	10.00	0.00
18		6/20-6/23	2156	2555	70.1	71.3	4	13.50	2.50	0.00	1.00	0.00	0.00	1.50	4.50	0.00	
19		6/27-6/30	1754	1937	70.7	71.6	4	2.50	0.25	0.00	0.25	0.00	0.00	0.00	2.75	0.00	

Due to high flows the Bogus frame net was not operated survey weeks 4–6, the I-5 screw traps were only operated one day in survey week 4 and not operated survey weeks 5 and 6, and the I-5 frame net was only operated for one day in survey week 1.



Table 3. 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 mainstem Klamath River, 2017. RST = rotary screw trap and YOY = young-of-the-year. Note: these data only include naturally-produced fish and end at the date of the release of hatchery fish.

Preliminary data - Subject to revision

Site	Calendar Week	2017 sampling dates	YOY Chinook (natural) - fork length data								YOY Coho - fork length data							
			2017				Previous 10 years				2017				Previous 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
Bogus Frame	9	Feb 28-Mar 2	3	38.3	36	43	0.0%	120	3	37.7	0	-	-	-	-	0	0	-
	10	Mar 8-9	2	35.0	31	39	0.0%	390	5	37.2	0	-	-	-	-	0	0	-
	11	-	0	-	-	-	-	570	9	37.0	0	-	-	-	-	2	1	34.0
	12	-	0	-	-	-	-	778	10	37.2	0	-	-	-	-	28	3	35.2
	13	-	0	-	-	-	-	808	9	37.5	0	-	-	-	-	145	5	34.1
	14	Apr 4-6	3	42.0	40	44	0.0%	870	10	37.6	0	-	-	-	-	162	8	34.4
	15	Apr 11-12	3	47.3	46	48	0.0%	840	10	38.5	4	37.3	35	40	0.0%	254	10	34.6
	16	Apr 20	5	43.0	37	48	0.0%	900	10	38.8	0	-	-	-	-	506	10	35.1
	17	Apr 25-27	2	47.0	46	48	0.0%	840	10	40.3	6	35.0	32	38	0.0%	514	8	34.6
	18	May 2-3	9	53.4	42	68	44.4%	805	10	43.4	3	33.7	31	36	0.0%	255	9	38.7
	19	May 9-11	4	54.8	45	63	50.0%	720	10	44.2	0	-	-	-	-	224	8	38.0
	20	May 18	0	-	-	-	-	515	8	46.8	1	45.0	45	45	0.0%	115	5	42.6
21	May 23-25	5	49.6	43	60	20.0%	244	4	46.1	1	51.0	51	51	0.0%	20	3	42.2	
Klamathon Seine	14	Apr 6	30	45.1	40	50	0.0%	141	8	40.3	0	-	-	-	-	1	1	42.0
	15	Apr 13	30	45.8	37	57	6.7%	262	10	41.4	4	39.3	37	43	0.0%	1	1	33.0
	16	Apr 20	30	46.2	34	65	13.3%	257	10	42.8	0	-	-	-	-	4	1	34.3
	17	Apr 27	12	47.9	37	65	33.3%	255	10	45.2	0	-	-	-	-	2	1	34.0
	18	May 4	22	60.6	41	77	86.4%	277	10	50.5	2	39.5	38	71	0.0%	0	0	-
	19	May 11	30	64.2	44	73	93.3%	243	10	50.2	0	-	-	-	-	1	1	47.0
	20	May 18	1	82.0	82	82	100.0%	234	9	52.2	0	-	-	-	-	4	3	46.7
21	May 24	23	74.3	60	90	100.0%	150	5	54.4	0	-	-	-	-	4	2	49.7	
I-5 RST's	10	Mar 9	9	38.1	36	42	0.0%	300	4	38.3	0	-	-	-	-	0	0	-
	11	Mar 14	15	39.3	36	42	0.0%	415	10	37.6	1	35.0	35	35	-	0	0	-
	12	-	0	-	-	-	-	514	10	38.0	0	-	-	-	-	0	0	-
	13	-	0	-	-	-	-	619	9	38.0	0	-	-	-	-	12	3	35.1
	14	Apr 4-6	22	46.6	31	58	18.2%	698	10	38.7	0	-	-	-	-	10	4	33.2
	15	Apr 11-12	3	53.7	49	58	33.3%	729	10	40.5	3	35.7	33	38	0.0%	48	6	34.5
	16	Apr 19-20	35	55.8	33	70	54.3%	772	10	42.1	0	-	-	-	-	111	8	34.4
	17	Apr 25-27	64	62.0	38	75	85.9%	716	10	45.2	2	36.0	36	36	0.0%	86	7	36.3
	18	May 2-4	90	62.2	39	88	91.1%	713	10	49.0	2	37.0	36	38	0.0%	27	5	40.9
	19	May 9-11	12	65.3	53	79	91.7%	775	10	52.1	1	40.0	40	40	0.0%	27	9	43.6
	20	May 16-17	3	68.3	37	90	66.7%	780	10	58.8	0	-	-	-	-	51	9	51.8
21	May 23-25	12	86.9	65	108	100.0%	407	7	66.5	1	48.0	48	48	0.0%	50	4	54.0	

Due to high flows the Bogus frame net was not operated calendar weeks 11–13, the I-5 screw traps were only operated one day in calendar week 11 and not operated calendar weeks 12 and 13, and no Chinook Salmon were caught while the I-5 frame net was operated for only one day in calendar week 8.



Table 4. 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 mainstem Klamath River, 2017. *Note: Although only Chinook Salmon are reported in this table, we also monitor clinical signs of diseases in Coho Salmon and other species. We have not observed any clinical signs of disease in Coho Salmon so far this season.*

Preliminary Data - Subject to Revision

Site	Calendar week	Sampling dates	Weekly mean flow (cfs) ^a	Water temp. (F) ^b		Belly Condition			Gills				
				Min	Max	Sample size	Distended		Color		Condition		
							n	%	n	%	n	%	
Bogus	9	Feb 28-Mar 2	4,000	41.5	41.9	1	0	- ^c	0	-	-	-	-
	10	Mar 8-10	3,257	41.3	41.5	2	0	- ^c	0	-	-	-	-
	11	-	7,114						-- TRAP NOT OPERATED THIS WEEK DUE TO HIGH FLOWS--				
	12	-	9,613						-- TRAP NOT OPERATED THIS WEEK DUE TO HIGH FLOWS--				
	13	-	7,916						-- TRAP NOT OPERATED THIS WEEK DUE TO HIGH FLOWS--				
	14	Apr 5-7	4,504	49.6	50.5	3	0	- ^c	0	-	-	-	-
	15	Apr 11-12	5,659	52.8	53.4	3	0	- ^c	3	0	- ^c	0	- ^c
	16	Apr 20	5,093	53.6	53.6	5	0	- ^c	3	1	- ^c	0	- ^c
	17	Apr 25	3,464	55.2	55.2	2	0	- ^c	2	0	- ^c	0	- ^c
	18	May 2-3	3,446	57.7	61.8	9	0	- ^c	7	1	- ^c	0	- ^c
	19	May 9-11	3,176	60.6	61.7	4	0	- ^c	4	0	- ^c	0	- ^c
20	May 16-18	3,046	61.3	61.8	0	-	-	0	-	-	-	-	
21	May 23-25	2,599	64.7	65.3	5	0	- ^c	4	0	- ^c	0	- ^c	
Klamathon	14	Apr 6	4,504	50.3	50.3	30	0	0.0%	17	0	0.0%	0	0.0%
	15	Apr 13	5,659	53.0	53.0	30	0	0.0%	15	0	0.0%	0	0.0%
	16	Apr 20	5,093	54.8	54.8	30	0	0.0%	16	0	0.0%	0	0.0%
	17	Apr 27	3,464	55.7	55.7	12	0	0.0%	5	0	- ^c	0	- ^c
	18	May 4	3,446	61.5	61.5	22	0	0.0%	21	0	0.0%	0	0.0%
	19	May 11	3,176	60.8	60.8	30	0	0.0%	29	0	0.0%	0	0.0%
	20	May 18	3,046	62.7	62.7	1	0	- ^c	1	0	- ^c	0	- ^c
	21	May 24	2,599	67.4	67.4	23	0	0.0%	23	0	0.0%	0	0.0%
I-5	8	Feb 22	5,451	41.9	41.9	0	-	-	0	-	-	-	-
	9	-	4,000						-- TRAPS NOT OPERATED THIS WEEK DUE TO HIGH FLOWS--				
	10	Mar 9-10	3,257	41.0	41.1	9	0	- ^c	0	-	-	-	-
	11	Mar 14	7,114	42.4	42.4	15	0	0.0%	0	-	-	-	-
	12	-	9,613						-- TRAPS NOT OPERATED THIS WEEK DUE TO HIGH FLOWS--				
	13	-	7,916						-- TRAPS NOT OPERATED THIS WEEK DUE TO HIGH FLOWS--				
	14	Apr 4-6	4,504	49.2	50.1	18	0	0.0%	15	0	0.0%	0	0.0%
	15	Apr 11-12	5,659	52.8	53.2	3	0	- ^c	3	0	- ^c	0	- ^c
	16	Apr 19-20	5,093	52.8	52.8	35	0	0.0%	31	0	0.0%	0	0.0%
	17	Apr 25-27	3,464	54.6	55.9	64	0	0.0%	63	0	0.0%	0	0.0%
	18	May 2-4	3,446	58.6	60.2	90	0	0.0%	88	0	0.0%	0	0.0%
19	May 9-11	3,176	61.1	61.7	12	0	0.0%	12	0	0.0%	0	0.0%	
20	May 16-17	3,046	60.2	61.1	3	0	- ^c	2	0	- ^c	0	- ^c	
21	May 23-25	2,599	64.7	66.3	11	0	0.0%	11	1	9.1%	1	9.1%	
Kinsman	22	Jun 1-2	4,643	64.4	66.0	36	0	0.0%	36	0	0.0%	0	0.0%
	23	Jun 6-8	3,760	66.0	67.4	90	0	0.0%	90	1	1.1%	0	0.0%
	24	Jun 13-15	3,279	62.9	66.0	85	0	0.0%	85	2	2.4%	1	1.2%
	25	Jun 20-22	2,414	70.1	71.3	26	1	3.8%	26	1	3.8%	0	0.0%
	26	Jun 27-29	1,873	70.7	71.6	4	0	- ^c	4	0	- ^c	0	- ^c

^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)

^c sample size too low for a reportable calculation

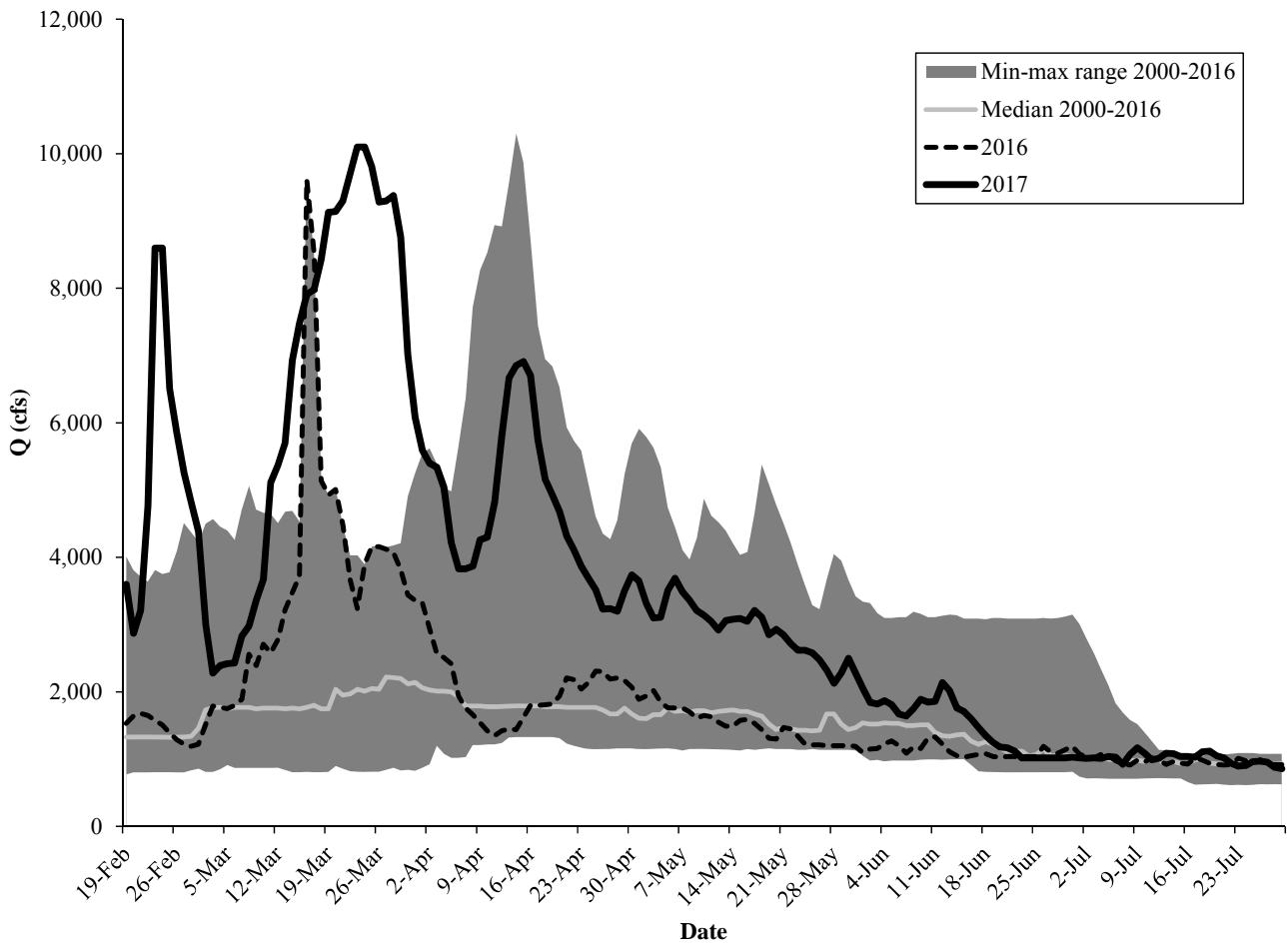


Figure 1. Daily mean discharge below Iron Gate Dam, Klamath River (USGS Gaging Station 11516530) from late February through July, 2000–2017.

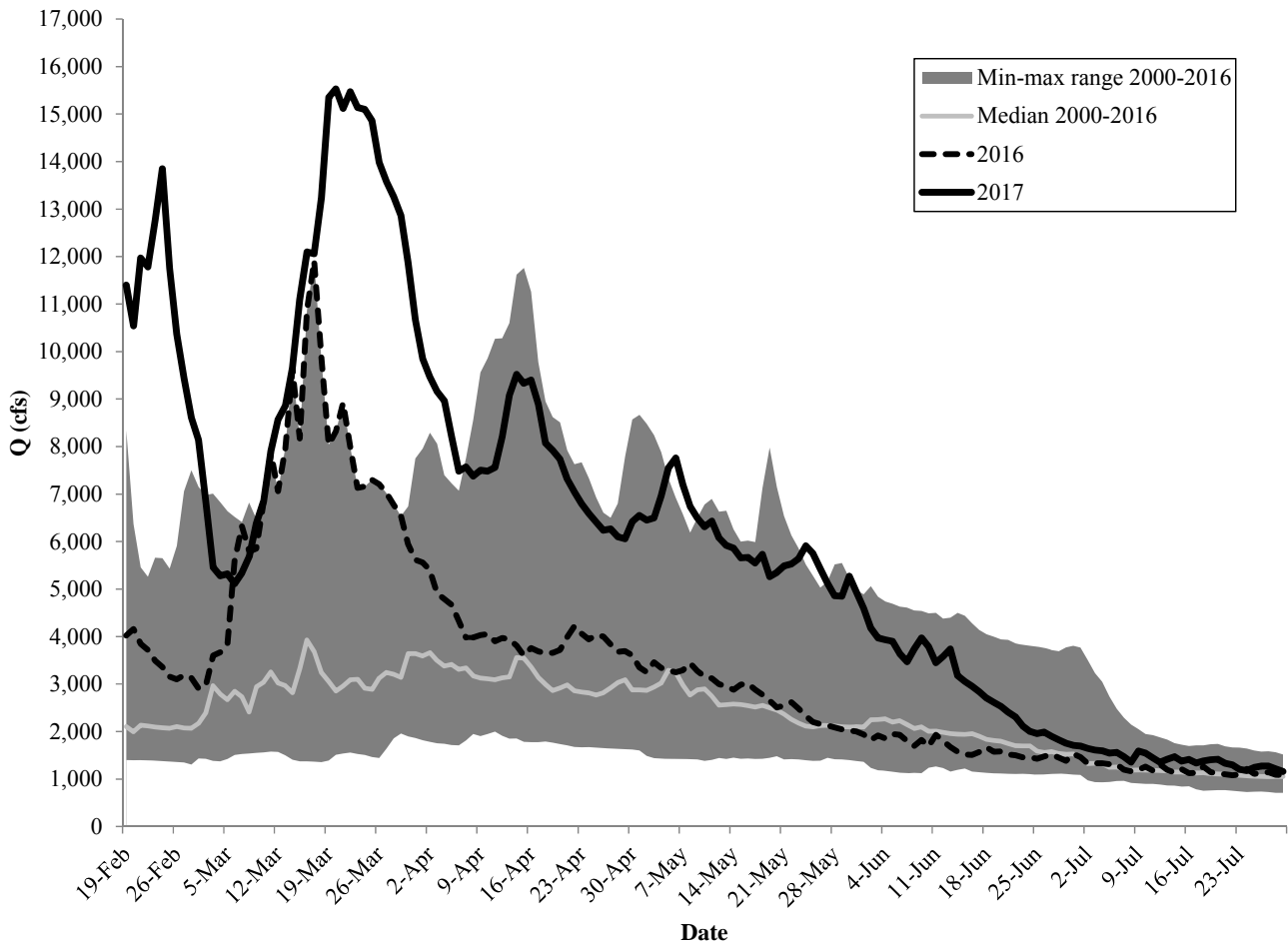


Figure 2. Klamath River daily mean discharge at the Kinsman Trap Site from late February through July, 2000–2017. Flow measurements are not available at this location. Therefore Klamath River flow near Seiad Valley, California (USGS Gaging Station 11520500) minus flow from the Scott River near Fort Jones, California (USGS 11511950) is used as a surrogate.