



## Klamath River Outmigrant Monitoring Summary — 2019

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 S<sup>3</sup> (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' is located on the right bank downstream of the Bogus Creek confluence on Blue Heron RV Park property. The second location is the 'I-5 Trap Site' (rkm 293.55), which is 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 is the 'Kinsman Trap Site' (rkm 237.55) and is positioned in a side channel 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 in-line 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 began March 5 [Calendar Week (CW) 10] at the I-5 site and March 6 (CW 10) at the Bogus and Kinsman sites. Trapping at the I-5 Frame concluded May 24 following a drop in catch numbers and a need to repair the net. Trapping at the Bogus Frame and I-5 RSTs concluded on June 4, the day before the first release of Brood Year 2018 Chinook Salmon smolts from Iron Gate Hatchery. Operation of the Kinsman site RST concluded on June 28 following a drop in both catch and flow at the site.

This project summary provides 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. Trap efficiency, a measure of the proportion of fish moving past a trap site that are caught, varies weekly. *Therefore raw catch numbers are not representative of actual abundance and we advise against using weekly raw catch numbers to make inferences on temporal abundance.*

*Note: Due to high flows, traps were not operated during Survey Week 6. Flawed sets at the I-5 Upstream RST and Bogus Frame are the reason for no reportable catches in Survey Weeks 5 and 14 respectively.*

Included in this project summary are clinical signs of disease observed in the catch for the trap sites (Table 4). The percentage of live YOY Chinook Salmon in the trap catches that exhibit distended bellies, gill fungus, and pale gills are presented separately for each site on a weekly basis (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. Distended bellies may be a clinical sign of infection by the myxosporean parasites, *Ceratonova shasta* and *Parvicapsula minibicornis*. Gills of juvenile salmonids  $\geq 45$  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 CA–NV FHC to process using qPCR assays. This season’s sampling began the week of March 24. 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 two or three in-season updates (which are posted on the AFWO website) and a final report for each season.

Daily mean discharge below IGD (Figure 1) and at the Kinsman Trap Site (Figure 2) from late February through July 2000-2019 were included to help portray pertinent flow conditions. Discharge 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 Shannon Boyle (707) 825-5149, Steve Gough (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, 2019. 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) <sup>a</sup>		Water temp. (F) <sup>b</sup>		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 Net	1	3/7-3/8	1730	2200	41.0	41.1	2	580	0	0	0	3	0	0	4	0	
	2	3/12-3/15	1630	1960	40.4	41.7	4	1652	0	0	0	2	0	0	1	0	
	3	3/19-3/22	1760	1910	42.8	45.3	4	1065	0	0	0	1	30	0	0	0	
	4	3/26-3/29	1640	1710	44.9	46.0	4	4045	0	0	0	0	0	0	2	0	
	5	4/2-4/3	2050	2750	48.5	48.5	2	3563	0	0	0	0	0	0	0	0	
	7	4/16-4/19	2940	3660	50.3	53.2	4	746	0	0	8	0	0	0	0	0	
	8	4/23-4/26	2730	3180	53.7	57.7	4	2703	0	0	45	0	0	12	0	0	
	9	4/30-5/3	2240	2510	58.6	60.0	4	1048	0	0	39	1	0	30	0	0	
	10	5/7-5/10	1850	2050	61.3	63.1	4	282	0	0	20	0	2	108	1	0	
	11	5/14-5/17	1350	1640	62.4	63.3	3	16	0	0	0	0	0	20	0	0	
	12	5/21-5/24	1190	1400	60.6	62.7	2	21	0	0	0	0	0	131	0	0	
	13	5/29-5/31	1420	1640	63.3	63.6	3	4	0	0	0	0	0	15	0	0	
	I-5 UPS RST	1	3/6-3/8	1580	2200	40.8	43.3	3	421	0	0	0	0	0	0	1	0
2		3/12-3/15	1630	1960	40.6	41.9	4	828	0	0	0	3	0	0	0	0	
3		3/19-3/22	1760	1910	42.0	44.9	4	961	0	0	0	1	430	0	1	0	
4		3/26-3/29	1640	1710	44.7	46.6	4	1014	0	0	0	0	8	0	0	0	
7		4/16-4/19	2940	3660	51.6	52.0	1	2914	0	0	2	0	1	1	0	0	
8		4/23-4/26	2730	3180	54.8	56.6	4	7266	0	0	5	1	1	18	2	0	
9		4/30-5/3	2240	2510	56.6	59.1	4	2162	0	0	0	1	1	52	3	0	
10		5/7-5/10	1850	2050	59.7	61.5	4	234	0	0	1	1	2	20	4	0	
11		5/14-5/17	1350	1640	60.4	62.9	4	111	0	0	0	1	7	5	0	0	
12		5/21-5/24	1190	1400	59.3	61.3	4	114	0	0	0	0	3	10	0	0	
13		5/29-5/31	1420	1640	61.7	63.6	3	215	0	0	0	0	0	10	1	0	
14		6/4-6/4	2410	2410	64.4	64.4	1	44	0	0	0	0	0	9	1	0	
I-5 DNS RST		1	3/6-3/8	1630	2200	40.8	43.3	3	373	0	0	0	1	0	0	1	0
		2	3/12-3/15	1580	1960	40.6	41.9	4	621	0	0	0	0	0	0	1	0
	3	3/19-3/22	1760	1910	42.0	44.9	4	638	0	0	0	0	263	0	0	0	
	4	3/26-3/29	1640	1710	44.7	46.0	4	859	0	0	0	0	12	0	0	0	
	5	4/2-4/3	2050	2750	49.4	49.4	2	641	0	0	0	0	0	0	0	0	
	7	4/16-4/19	2940	3660	51.6	52.1	2	1957	0	0	1	1	0	1	0	0	
	8	4/23-4/26	2730	3180	54.8	56.6	4	4319	0	0	5	0	1	55	0	0	
	9	4/30-5/3	2240	2510	56.6	59.3	4	2013	0	0	10	1	1	71	2	0	
	10	5/7-5/10	1850	2050	59.7	61.5	4	247	0	1	0	1	2	37	2	0	
	11	5/14-5/17	1350	1640	60.4	62.9	4	103	0	0	0	1	1	2	1	0	
	12	5/21-5/24	1190	1400	59.3	61.3	4	100	0	0	0	0	4	3	0	0	
	13	5/29-5/31	1420	1640	61.7	63.6	3	166	0	0	0	0	0	23	0	0	
	14	6/4-6/4	2410	2410	64.4	64.4	1	33	0	0	0	0	0	20	0	0	
	I-5 Frame Net	1	3/7-3/8	1730	2200	40.8	42.2	2	402	0	0	0	0	0	0	0	0
2		3/12-3/15	1630	1960	40.6	41.9	4	660	0	0	0	0	0	0	1	0	
3		3/19-3/22	1760	1910	42.0	44.9	4	606	0	0	0	0	19	0	0	0	
4		3/26-3/29	1640	1710	44.7	46.0	4	849	0	0	1	0	2	0	0	0	
5		4/2-4/3	2050	2750	49.4	49.4	1	435	0	0	0	0	0	1	0	0	
7		4/16-4/19	2050	3660	51.6	52.7	4	633	0	0	12	0	0	7	0	0	
8		4/23-4/26	2730	3180	54.8	56.6	4	2487	0	0	34	0	0	23	0	0	
9		4/30-5/3	2240	2510	56.6	59.3	4	1586	0	0	9	0	0	47	0	0	
10		5/7-5/10	1850	2050	59.7	61.5	4	194	0	0	8	0	1	37	0	0	
11		5/14-5/17	1350	1640	60.4	62.9	4	26	0	0	0	0	0	4	0	0	
12		5/21-5/24	1190	1400	59.3	61.3	4	37	0	0	0	0	1	7	0	0	



Table 1 (continued). 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, 2019. 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) <sup>a</sup>		Water temp. (F) <sup>b</sup>		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
Kinsman RST	1	3/7-3/8	3600	3800	39.2	42.6	2	192	0	0	0	1	0	0	2	0
	2	3/12-3/15	2788	3193	40.1	44.0	4	1663	0	0	0	0	0	0	1	0
	3	3/19-3/22	3406	3780	44.6	47.3	4	669	0	0	0	1	1	0	2	0
	4	3/26-3/29	3131	3312	44.6	47.9	4	601	0	0	0	1	0	0	0	0
	5	4/2-4/4	3900	5480	48.2	48.2	1	265	0	0	0	1	0	2	3	0
	7	4/17-4/19	5440	5710	53.9	53.9	3	1117	0	1	1	3	3	0	12	0
	8	4/23-4/26	5570	5930	54.5	58.9	3	1394	0	0	2	4	0	4	20	0
	9	4/30-5/3	4080	4340	47.3	47.3	4	458	0	0	1	11	3	0	36	0
	10	5/7-5/10	3460	3750	48.2	60.6	4	84	0	0	0	1	2	0	40	0
	11	5/14-5/17	2690	3060	58.4	58.4	4	46	0	0	0	2	0	0	7	0
	12	5/21-5/24	2370	2456	60.8	60.8	4	37	0	0	0	0	0	0	12	0
	13	5/29-5/31	2820	2880	64.4	64.4	2	20	0	0	0	0	0	1	20	0
	14	6/4-6/7	4010	4420	63.1	65.8	1	36	1	0	0	0	0	0	12	0
	15	6/11-6/14	3067	3657	65.6	69.2	4	265	17	1	1	0	0	1	17	0
	16	6/18-6/21	1775	2146	65.8	69.8	4	62	9	0	0	0	0	1	6	0
	17	6/25-6/28	1378	1453	64.4	66.2	4	45	2	0	1	0	0	0	9	0

<sup>a</sup> mean discharge from day of sampling (discharge below IGD used for Bogus and I-5 sites; flow at Kinsman Site is Klamath River flow at Seiad minus Scott River flow)

<sup>b</sup> 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 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, 2019. 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) <sup>a</sup>		Water temp. (F) <sup>b</sup>		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 Net	1	3/7-3/8	1730	2200	41.0	41.1	2	290.00	0.00	0.00	0.00	1.50	0.00	0.00	2.00	0.00	
	2	3/12-3/15	1630	1960	40.4	41.7	4	413.00	0.00	0.00	0.00	0.50	0.00	0.00	0.25	0.00	
	3	3/19-3/22	1760	1910	42.8	45.3	4	266.25	0.00	0.00	0.00	0.25	7.50	0.00	0.00	0.00	
	4	3/26-3/29	1640	1710	44.9	46.0	4	1011.25	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	
	5	4/2-4/3	2050	2750	48.5	48.5	2	1781.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	7	4/16-4/19	2940	3660	50.3	53.2	4	186.50	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	
	8	4/23-4/26	2730	3180	53.7	57.7	4	675.75	0.00	0.00	11.25	0.00	0.00	3.00	0.00	0.00	
	9	4/30-5/3	2240	2510	58.6	60.0	4	262.00	0.00	0.00	9.75	0.25	0.00	7.50	0.00	0.00	
	10	5/7-5/10	1850	2050	61.3	63.1	4	70.50	0.00	0.00	5.00	0.00	0.50	27.00	0.25	0.00	
	11	5/14-5/17	1350	1640	62.4	63.3	3	5.33	0.00	0.00	0.00	0.00	0.00	6.67	0.00	0.00	
	12	5/21-5/24	1190	1400	60.6	62.7	2	10.50	0.00	0.00	0.00	0.00	0.00	65.50	0.00	0.00	
	13	5/29-5/31	1420	1640	63.3	63.6	3	1.33	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	
	I-5 UPS RST	1	3/6-3/8	1580	2200	40.8	43.3	3	140.33	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00
2		3/12-3/15	1630	1960	40.6	41.9	4	207.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.00	
3		3/19-3/22	1760	1910	42.0	44.9	4	240.25	0.00	0.00	0.00	0.25	107.50	0.00	0.25	0.00	
4		3/26-3/29	1640	1710	44.7	46.6	4	253.50	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	
7		4/16-4/19	2940	3660	51.6	52.0	1	2914.00	0.00	0.00	2.00	0.00	1.00	1.00	0.00	0.00	
8		4/23-4/26	2730	3180	54.8	56.6	4	1816.50	0.00	0.00	1.25	0.25	0.25	4.50	0.50	0.00	
9		4/30-5/3	2240	2510	56.6	59.1	4	540.50	0.00	0.00	0.00	0.25	0.25	13.00	0.75	0.00	
10		5/7-5/10	1850	2050	59.7	61.5	4	58.50	0.00	0.00	0.25	0.25	0.50	5.00	1.00	0.00	
11		5/14-5/17	1350	1640	60.4	62.9	4	27.75	0.00	0.00	0.00	0.25	1.75	1.25	0.00	0.00	
12		5/21-5/24	1190	1400	59.3	61.3	4	28.50	0.00	0.00	0.00	0.00	0.75	2.50	0.00	0.00	
13		5/29-5/31	1420	1640	61.7	63.6	3	71.67	0.00	0.00	0.00	0.00	0.00	3.33	0.33	0.00	
14		6/4-6/4	2410	2410	64.4	64.4	1	44.00	0.00	0.00	0.00	0.00	0.00	9.00	1.00	0.00	
I-5 DNS RST		1	3/6-3/8	1580	2200	40.8	43.3	3	124.33	0.00	0.00	0.00	0.33	0.00	0.00	0.33	0.00
		2	3/12-3/15	1630	1960	40.6	41.9	4	155.25	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00
	3	3/19-3/22	1760	1910	42.0	44.9	4	159.50	0.00	0.00	0.00	0.00	65.75	0.00	0.00	0.00	
	4	3/26-3/29	1640	1710	44.7	46.0	4	214.75	0.00	0.00	0.00	0.00	3.00	0.00	0.00	0.00	
	5	4/2-4/3	2050	2750	49.4	49.4	2	320.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	7	4/16-4/19	2940	3660	51.6	52.1	2	978.50	0.00	0.00	0.50	0.50	0.00	0.50	0.00	0.00	
	8	4/23-4/26	2730	3180	54.8	56.6	4	1079.75	0.00	0.00	1.25	0.00	0.25	13.75	0.00	0.00	
	9	4/30-5/3	2240	2510	56.6	59.3	4	503.25	0.00	0.00	2.50	0.25	0.25	17.75	0.50	0.00	
	10	5/7-5/10	1850	2050	59.7	61.5	4	61.75	0.00	0.25	0.00	0.25	0.50	9.25	0.50	0.00	
	11	5/14-5/17	1350	1640	60.4	62.9	4	25.75	0.00	0.00	0.00	0.25	0.25	0.50	0.25	0.00	
	12	5/21-5/24	1190	1400	59.3	61.3	4	25.00	0.00	0.00	0.00	0.00	1.00	0.75	0.00	0.00	
	13	5/29-5/31	1420	1640	61.7	63.6	3	55.33	0.00	0.00	0.00	0.00	0.00	7.67	0.00	0.00	
	14	6/4-6/4	2410	2410	64.4	64.4	1	33.00	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	
	I-5 Frame Net	1	3/7-3/8	1730	2200	40.8	42.2	2	201.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2		3/12-3/15	1630	1960	40.6	41.9	4	165.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	
3		3/19-3/22	1760	1910	42.0	44.9	4	151.50	0.00	0.00	0.00	0.00	4.75	0.00	0.00	0.00	
4		3/26-3/29	1640	1710	44.7	46.0	4	212.25	0.00	0.00	0.25	0.00	0.50	0.00	0.00	0.00	
5		4/2-4/3	2050	2750	49.4	49.4	1	435.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	
7		4/16-4/19	2940	3660	51.6	52.7	4	158.25	0.00	0.00	3.00	0.00	0.00	1.75	0.00	0.00	
8		4/23-4/26	2730	3180	54.8	56.6	4	621.75	0.00	0.00	8.50	0.00	0.00	5.75	0.00	0.00	
9		4/30-5/3	2240	2510	56.6	59.3	4	396.50	0.00	0.00	2.25	0.00	0.00	11.75	0.00	0.00	
10		5/7-5/10	1850	2050	59.7	61.5	4	48.50	0.00	0.00	2.00	0.00	0.25	9.25	0.00	0.00	
11		5/14-5/17	1350	1640	60.4	62.9	4	6.50	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	
12		5/21-5/24	1190	1400	59.3	61.3	4	9.25	0.00	0.00	0.00	0.00	0.25	1.75	0.00	0.00	



Table 2 (continued). 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, 2019. 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) <sup>a</sup>		Water temp. (F) <sup>b</sup>		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
Kinsman RST	1	3/7-3/8	3600	3800	39.2	42.6	2	96.00	0.00	0.00	0.00	0.50	0.00	0.00	1.00	0.00
	2	3/12-3/15	1410	3193	40.1	44.0	4	415.75	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00
	3	3/19-3/22	3406	3780	44.6	47.3	4	167.25	0.00	0.00	0.00	0.25	0.25	0.00	0.50	0.00
	4	3/26-3/29	3131	3312	44.6	47.9	4	150.25	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00
	5	4/2-4/4	3900	5480	48.2	48.2	1	265.00	0.00	0.00	0.00	1.00	0.00	2.00	3.00	0.00
	7	4/17-4/19	5440	5710	53.9	53.9	3	372.33	0.00	0.33	0.33	1.00	1.00	0.00	4.00	0.00
	8	4/23-4/26	5570	5930	54.5	58.9	3	464.67	0.00	0.00	0.67	1.33	0.00	1.33	6.67	0.00
	9	4/30-5/3	4080	4340	47.3	47.3	4	114.50	0.00	0.00	0.25	2.75	0.75	0.00	9.00	0.00
	10	5/7-5/10	3460	3750	48.2	60.6	4	21.00	0.00	0.00	0.00	0.25	0.50	0.00	10.00	0.00
	11	5/14-5/17	2690	3060	58.4	58.4	4	11.50	0.00	0.00	0.00	0.50	0.00	0.00	1.75	0.00
	12	5/21-5/24	2370	2456	60.8	60.8	4	9.25	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00
	13	5/29-5/31	2820	2880	64.4	64.4	2	10.00	0.00	0.00	0.00	0.00	0.00	0.50	10.00	0.00
	14	6/4-6/7	4010	4420	63.1	65.8	1	36.00	1.00	0.00	0.00	0.00	0.00	0.00	12.00	0.00
	15	6/11-6/14	3067	3657	65.6	69.2	4	66.25	4.25	0.25	0.25	0.00	0.00	0.25	4.25	0.00
	16	6/18-6/21	1775	2146	65.8	69.8	4	15.50	2.25	0.00	0.00	0.00	0.00	0.25	1.50	0.00
	17	6/25-6/28	1378	1453	64.4	66.2	4	11.25	0.50	0.00	0.25	0.00	0.00	0.00	2.25	0.00

<sup>a</sup> 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)

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



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, I-5, and Kinsman sites on the mainstem Klamath River, 2019. 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	2019 sampling dates	YOY Chinook (natural) - fork length data							YOY Coho - fork length data								
			2019				Previous 10 years			2019				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	Mean (mm)
Bogus Frame	10	Mar 7	30	36.5	35	39	0.0%	468	7	36.8	0	-	-	-	0	0	-	
	11	Mar 12-14	90	36.2	33	40	0.0%	600	8	37.1	0	-	-	-	2	1	34.0	
	12	Mar 19-22	90	36.4	31	42	0.0%	718	9	37.1	0	-	-	-	28	3	35.2	
	13	Mar 26-29	90	36.4	32	41	0.0%	718	8	37.4	0	-	-	-	142	4	33.3	
	14	Apr 2-3	60	35.6	33	39	0.0%	783	10	38.2	0	-	-	-	158	7	34.2	
	16	Apr 16-19	90	38.3	33	48	0.0%	815	10	39.7	5	35.2	34	37	0.0%	504	9	35.0
	17	Apr 23-26	90	40.3	30	56	2.2%	752	10	41.6	32	33.9	30	36	0.0%	454	8	34.7
	18	Apr 29- May 3	90	42.8	33	58	3.3%	701	10	45.3	30	33.9	30	39	0.0%	210	9	38.6
	19	May 7-10	90	45.2	32	88	14.4%	590	10	45.9	15	36.8	32	42	0.0%	142	8	38.7
	20	May 14-17	14	52.7	34	83	42.9%	459	7	48.6	0	-	-	-	79	6	43.6	
	21	May 21-24	16	50.8	36	107	25.0%	202	5	53.6	0	-	-	-	19	3	46.9	
	22	May 29-31	3	76.0	66	83	100.0%	92	3	56.3	0	-	-	-	21	2	50.6	
	23	June 4	4	79.0	57	99	100.0%	32	1	52.9	0	-	-	-	0	0	-	
I-5 RST's	10	Mar 6-7	60	36.1	31	40	0.0%	386	6	37.9	0	-	-	-	0	0	-	
	11	Mar 12-14	90	37.2	32	41	0.0%	455	10	38.0	0	-	-	-	1	1	35.0	
	12	Mar 19-22	90	36.3	33	41	0.0%	544	9	37.6	0	-	-	-	0	0	-	
	13	Mar 26-29	90	36.2	34	44	0.0%	574	8	37.9	0	-	-	-	12	3	35.1	
	14	Apr 2-3	60	37.0	32	47	0.0%	643	10	39.4	0	-	-	-	10	4	33.2	
	16	Apr 16-19	60	45.5	36	58	3.3%	675	10	44.6	0	-	-	-	105	6	34.7	
	17	Apr 23-26	90	42.4	34	60	2.2%	689	10	48.2	5	34.6	32	38	0.0%	88	8	36.2
	18	Apr 29- May 3	90	44.4	32	68	4.4%	732	10	52.0	10	44.1	41	49	0.0%	30	7	41.1
	19	May 7-10	89	50.3	34	83	23.3%	656	10	55.4	0	-	-	-	21	9	43.6	
	20	May 14-17	88	56.7	40	90	55.7%	693	10	62.8	0	-	-	-	44	8	51.9	
	21	May 21-24	90	67.2	43	103	65.6%	389	7	72.6	0	-	-	-	53	5	55.1	
	22	May 29-31	60	73.4	38	106	86.7%	245	4	72.8	0	-	-	-	49	3	57.5	
	23	June 4	30	78.1	57	100	100.0%	139	3	83.2	0	-	-	-	11	3	60.8	
I-5 Frame	10	Mar 7	30	37.3	34	43	0.0%	151	3	38.9	0	-	-	-	0	0	-	
	11	Mar 12-14	90	36.6	31	41	0.0%	152	5	37.7	0	-	-	-	1	1	35.0	
	12	Mar 19-22	90	36.6	31	42	0.0%	331	6	37.3	0	-	-	-	14	2	35.4	
	13	Mar 26-29	90	36.3	32	40	0.0%	382	6	37.9	1	30.0	30	30	0.0%	78	4	33.9
	14	Apr 2-3	60	36.6	33	45	0.0%	360	6	38.4	0	-	-	-	61	4	34.5	
	16	Apr 16-19	90	42.1	34	55	0.0%	361	6	42.8	9	34.3	34	35	0.0%	88	6	35.8
	17	Apr 23-26	90	42.8	32	59	1.1%	325	6	45.1	25	35.1	30	40	0.0%	53	5	36.2
	18	Apr 29- May 3	90	42.8	35	52	0.0%	223	6	50.9	8	38.1	34	39	0.0%	17	3	41.7
	19	May 7-10	90	46.6	34	65	11.1%	147	5	49.3	6	40.8	38	45	0.0%	8	3	42.1
	20	May 14-17	19	49.0	33	68	15.8%	123	4	56.4	0	-	-	-	8	3	48.1	
	21	May 21-24	27	61.4	38	97	55.6%	29	2	67.7	0	-	-	-	0	0	-	
Kinsman RST	10	Mar 7	30	36.7	33	41	0.0%	256	5	38.5	0	-	-	-	0	0	-	
	11	Mar 12-14	90	37.8	34	50	0.0%	295	8	40.2	0	-	-	-	12	1	33.4	
	12	Mar 19-22	90	39.3	33	56	0.0%	497	8	43.3	0	-	-	-	33	2	35.0	
	13	Mar 26-29	90	38.4	34	52	0.0%	580	7	44.4	0	-	-	-	77	3	34.6	
	14	Apr 2-4	30	38.2	33	49	0.0%	577	8	45.8	0	-	-	-	63	6	35.2	
	15 <sup>b</sup>	Apr 9-12	150	40.7	33	56	0.0%	500	9	48.2	0	-	-	-	62	7	35.0	
	16	Apr 17-19	60	45.8	37	65	3.3%	615	9	52.5	1	34.0	34	34	0.0%	105	6	33.6
	17	Apr 23-26	90	44.9	33	67	6.6%	690	9	53.7	0	-	-	-	100	5	39.5	
	18	Apr 29- May 3	90	48.8	36	68	20.0%	621	9	57.4	0	-	-	-	45	5	38.0	
	19	May 7-10	41	51.7	35	74	31.7%	515	9	61.8	0	-	-	-	47	7	44.0	
	20	May 14-17	38	45.6	35	73	10.5%	583	9	65.8	0	-	-	-	80	9	47.6	
	21	May 21-24	29	55.4	38	85	41.4%	601	9	69.2	0	-	-	-	80	7	54.0	
	22	May 29-31	11	68.6	53	113	90.9%	242	5	74.4	0	-	-	-	81	7	55.7	
23	June 4-7	26	72.2	55	91	96.2%	97	4	73.2	0	-	-	-	46	5	58.7		

<sup>a</sup> fish were sampled via beach seine at Klamathon Bridge (RKM 300.7) in lieu of Bogus and I-5 traps not running due to high flows

<sup>b</sup> fish were sampled via beach seine at the Klamath River Community Hall (RKM 258.05) in lieu of the Kinsman RST not running due to high flows



Table 4. In-season summary of clinical signs of disease in young-of-the-year Chinook Salmon by site at the Bogus, I-5, and Kinsman sites on the mainstem Klamath River, 2019. *Note: Although only Chinook Salmon are reported in this table, we also monitor clinical signs of diseases in Coho Salmon and other species.*

Preliminary Data - Subject to Revision

Site	Calendar week	Sampling dates	Weekly mean flow (cfs) <sup>a</sup>	Water temp. (F) <sup>b</sup>		Belly Condition			Gills				
				Min	Max	Sample size	Distended		Sample size	Color		Condition	
							# positive	%		# positive	%	# positive	%
Bogus	10	Mar 7	1,900	41.0	41.0	26	0	0.0%	0	-	-	-	-
	11	Mar 12-14	1,899	40.4	41.7	90	0	0.0%	0	-	-	-	-
	12	Mar 19-22	1,820	42.8	45.3	90	0	0.0%	0	-	-	-	-
	13	Mar 26-29	1,670	44.9	46.0	90	0	0.0%	0	-	-	-	-
	14	Apr 2-3	3,130	48.5	48.5	60	0	0.0%	0	-	-	-	-
	16	Apr 16-19	3,511	50.3	53.2	90	0	0.0%	3	1	- <sup>c</sup>	0	- <sup>c</sup>
	17	Apr 23-26	2,953	53.7	57.7	90	0	0.0%	14	0	- <sup>c</sup>	0	- <sup>c</sup>
	18	Apr 30 - May 3	2,429	58.6	60.0	90	0	0.0%	32	0	0.0%	0	0.0%
	19	May 7-10	1,987	61.3	62.0	90	0	0.0%	32	3	9.4%	3	9.4%
	20	May 14-17	1,564	62.4	63.3	14	0	0.0%	11	2	- <sup>c</sup>	1	- <sup>c</sup>
	21	May 21-24	1,301	60.6	62.7	21	2	9.5%	8	5	- <sup>c</sup>	3	- <sup>c</sup>
	22	May 29-31	1,561	63.3	63.6	3	0	0.0%	3	2	- <sup>c</sup>	0	- <sup>c</sup>
	23	June 4	2,587	65.8	65.8	4	2	50.0%	4	4	- <sup>c</sup>	0	- <sup>c</sup>
Klamathon	15 <sup>d</sup>	Apr 9-12	6,864	51.0	51.6	120	0	0.0%	7	0	- <sup>c</sup>	0	- <sup>c</sup>
I-5	10	Mar 6-7	1,900	42.2	43.3	89	0	0.0%	0	-	-	-	-
	11	Mar 12-14	1,899	40.6	41.9	175	0	0.0%	0	-	-	-	-
	12	Mar 19-22	1,820	42.0	44.9	180	0	0.0%	0	-	-	-	-
	13	Mar 26-29	1,670	44.7	46.6	180	0	0.0%	0	-	-	-	-
	14	Apr 2-3	3,130	49.4	49.4	120	0	0.0%	0	-	-	-	-
	16	Apr 16-19	3,511	51.6	52.7	150	0	0.0%	46	4	8.7%	0	0.0%
	17	Apr 23-26	2,953	54.8	56.6	180	0	0.0%	40	1	2.5%	0	0.0%
	18	Apr 30 - May 3	2,429	56.6	59.3	180	0	0.0%	54	1	1.9%	0	0.0%
	19	May 7-10	1,987	59.7	61.5	180	0	0.0%	91	2	2.2%	2	2.2%
	20	May 14-17	1,564	60.4	62.9	102	2	2.0%	90	9	10.0%	6	6.7%
	21	May 21-24	1,301	59.3	61.3	117	24	20.5%	103	27	26.2%	12	11.7%
	22	May 29-31	1,561	61.7	63.6	60	17	28.3%	58	0	0.0%	0	0.0%
	23	June 4	2,587	64.4	64.4	30	5	16.7%	30	12	40.0%	7	23.3%
Kinsman	10	Mar 7	3,734	39.2	39.2	30	0	0.0%	0	-	-	-	-
	11	Mar 12-14	3,222	40.1	43.7	90	0	0.0%	4	0	- <sup>c</sup>	0	- <sup>c</sup>
	12	Mar 19-22	3,530	44.6	47.3	90	0	0.0%	12	0	- <sup>c</sup>	0	- <sup>c</sup>
	13	Mar 26-29	3,212	44.6	47.9	90	0	0.0%	8	0	- <sup>c</sup>	0	- <sup>c</sup>
	14	Apr 2-4	4,802	48.2	48.2	30	0	0.0%	1	0	- <sup>c</sup>	0	- <sup>c</sup>
	15 <sup>e</sup>	Apr 9-12	10,873	49.6	51.0	150	0	0.0%	28	0	0.0%	0	0.0%
	16	Apr 17-19	6,131	53.9	53.9	60	0	0.0%	33	0	0.0%	0	0.0%
	17	Apr 23-26	5,708	54.5	58.9	90	0	0.0%	37	0	0.0%	0	0.0%
	18	Apr 30 - May 3	4,396	47.0	47.0	90	0	0.0%	61	0	0.0%	0	0.0%
	19	May 7-10	3,661	48.2	60.6	51	4	7.8%	35	2	5.7%	2	5.7%
	20	May 14-17	2,990	58.4	58.4	38	1	2.6%	11	1	- <sup>c</sup>	1	- <sup>c</sup>
	21	May 21-24	2,443	60.8	60.8	11	6	54.5%	9	3	- <sup>c</sup>	0	- <sup>c</sup>
	22	May 29-31	2,820	64.4	64.4	7	0	0.0%	7	3	- <sup>c</sup>	0	- <sup>c</sup>
23	June 4-7	4,061	63.1	65.8	19	4	21.1%	19	14	73.7%	9	47.4%	
24	June 11-14	3,491	65.6	69.2	90	0	0.0%	90	8	8.9%	3	3.3%	
25	June 18-21	2,112	65.8	69.8	60	28	46.7%	60	43	71.7%	12	20.0%	
26	June 25-28	1,429	64.4	66.2	19	10	52.6%	19	2	10.5%	0	0.0%	

<sup>a</sup> discharge below IGD used for Bogus and I-5 sites; discharge at Kinsman Site is Klamath River discharge near Seiad Valley minus discharge in the Scott River near Fort Jones

<sup>b</sup> temperature recorded at time of trap check/seine (true daily ranges from temperature loggers will become available at the end of the season)

<sup>c</sup> sample size too low for a reportable calculation

<sup>d</sup> fish were sampled via beach seine at Klamathon Bridge (RKM 300.7) in lieu of Bogus and I-5 traps not running due to high flows

<sup>e</sup> fish were sampled via beach seine at the Klamath River Community Hall (RKM 258.05) in lieu of Kinsman RST not running due to high flows



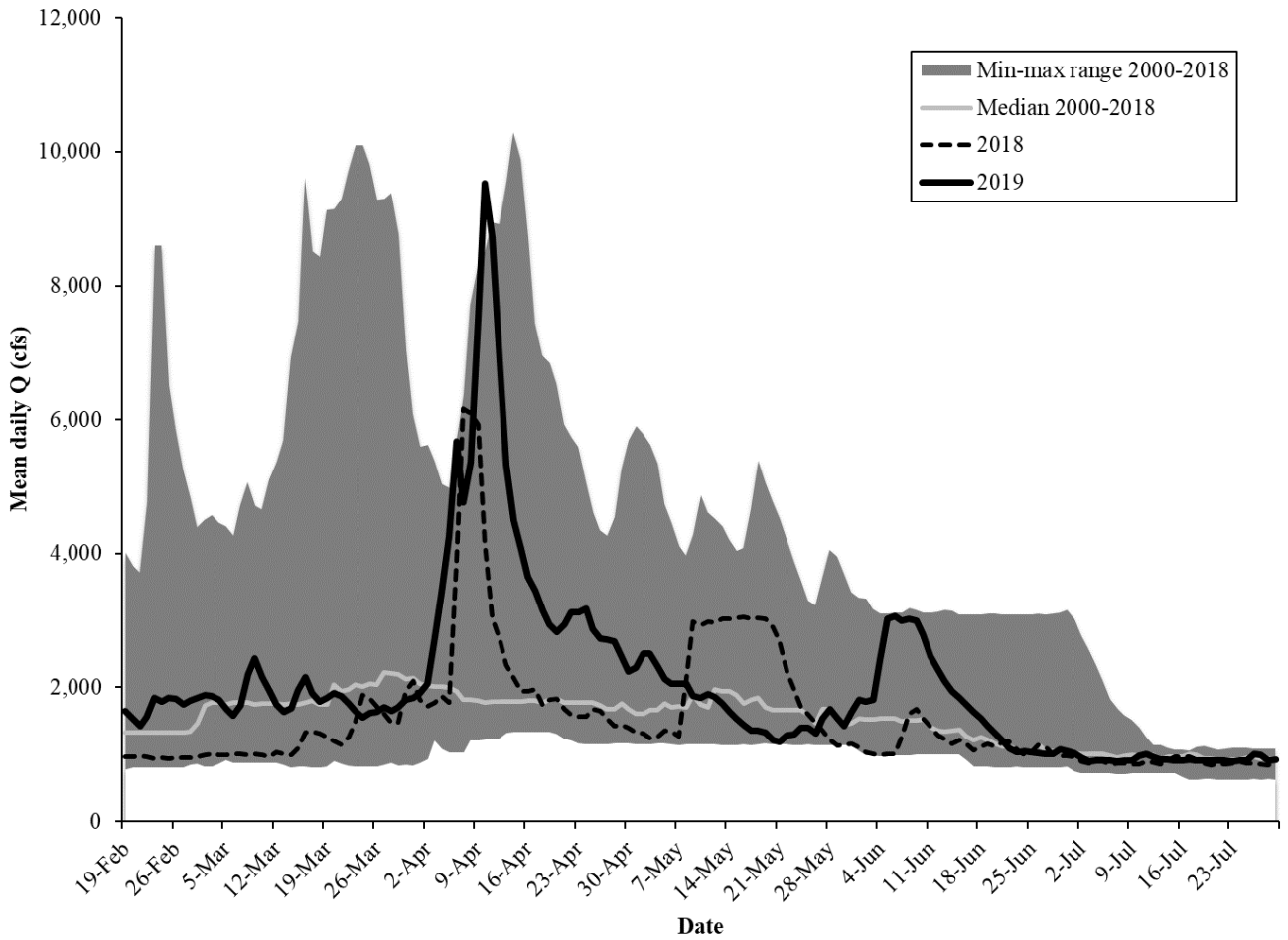


Figure 1. Daily mean discharge below Iron Gate Dam, Klamath River (USGS Gaging Station 11516530) from late February through July, 2000–2019.

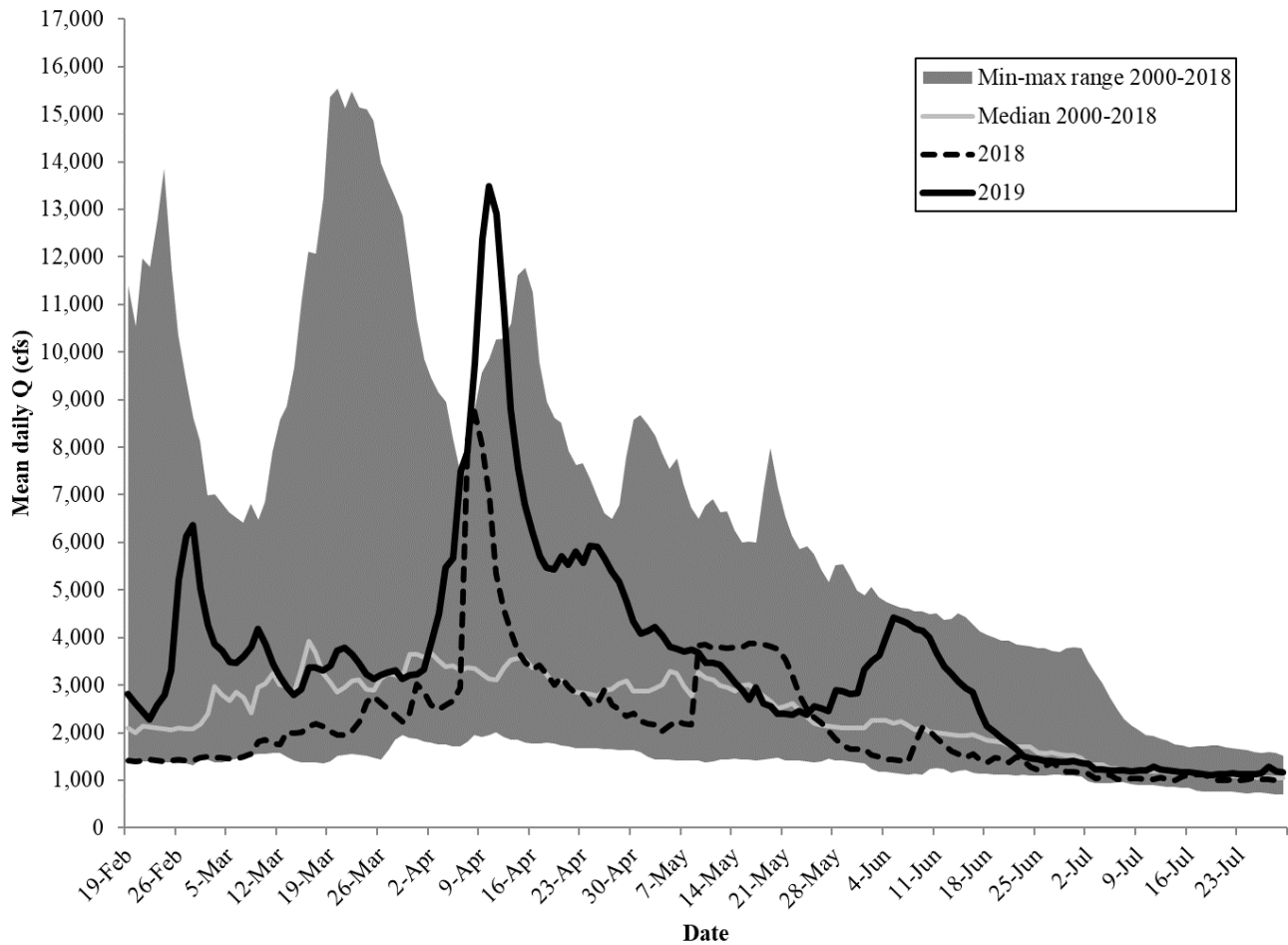


Figure 2. Klamath River daily mean discharge at the Kinsman Trap Site from late February through July, 2000–2019. Flow measurements are not available at this location. Therefore Klamath River flow near Seiad Valley, California (USGS Gaging Station 11520500) minus flow from the Scott River near Fort Jones, California (USGS 11519500) is used as a surrogate.