U.S. Fish & Wildlife Service

Arcata Fish & Wildlife Office Fisheries Program

Klamath River Outmigrant Monitoring Update – May 12, 2014

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 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 develop a fish disease model, and to validate and calibrate the S^3 (Stream Salmonid Simulator) Chinook salmon production model, among others.

Monitoring this season began on February 18, 2014 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 on the left bank just upstream of the Kinsman Creek confluence. Trapping at the Bogus Trap Site is conducted using a single 3.1 m wide and 1.6 m tall frame net. Sampling at the I-5 Trap Site is 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 is used to capture fish at the Kinsman Trap Site. Traps are typically operated four nights per week (Monday through Thursday) and checked once daily while in operation. Monitoring will continue until all wild and hatchery juvenile Chinook salmon have moved downstream of the study area.

Supplemental migration timing and magnitude and fish size data are 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 mean catch per day by week (Table 1) of Chinook and coho salmon, and steelhead at each trap site. In addition, we provide 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 update is a weekly-stratified summary of clinical signs of disease observed in the catch for the trap and seine 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 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. 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 (Figure2) from March through July 2000 to 2014 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 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, 2014. Note that RST = rotary screw trap, UPS = upstream, DNS = downstream, and YOY = young-of-the-year.

Preliminary Data - Subject to Revision

								Chinook (*O. tshawytscha*)			Coho (*O. kisutch*)			Steelhead (*O. mykiss*)		
								YOY				Age 1 +			Age 1 +	
Trap	Survey Week	Sample Dates	Q (cfs) [a] Min	Q (cfs) [a] Max	Water Temp. (F) [b] Min	Water Temp. (F) [b] Max	Trapping Days	No Clip	AD Clip	Age 1+	YOY	No Clip	LM Clip	YOY	No Clip	AD Clip
Bogus Frame	1	2/19-2/21	1120	1240	40.8	41.3	3	21.67	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00
	2	2/26-2/28	983	1150	42.8	43.7	3	84.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3	3/4-3/7	1030	1060	44.2	45.3	4	501.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4	3/11-3/14	1150	1680	46.2	46.4	4	767.75	0.00	0.00	0.75	0.00	0.00	0.00	0.25	0.00
	5	3/18-3/21	1730	1880	46.9	48.7	4	591.25	0.00	0.00	6.00	0.00	1.75	0.00	0.00	0.00
	6	3/25-3/28	1420	1580	48.9	49.4	4	1455.75	0.00	0.00	42.50	0.00	0.00	0.00	0.00	0.00
	7	4/1-4/4	1330	1350	48.3	49.4	4	1437.25	0.00	0.00	146.50	0.00	0.00	0.00	0.25	0.00
	8	4/8-4/11	1360	1470	51.9	53.2	4	1083.00	0.00	0.00	277.00	0.00	0.00	0.00	0.00	0.00
	9	4/15-4/18	1330	1330	53.9	55.0	4	378.00	0.00	0.00	218.75	0.00	0.00	1.25	0.00	0.00
	10	4/22-4/25	1330	1340	53.9	56.3	4	518.50	0.00	0.00	118.00	0.00	0.00	50.25	0.25	0.00
	11	4/29-5/1	1280	1330	56.6	58.2	3	91.67	0.00	0.33	18.00	0.00	0.00	137.33	0.33	0.00
	12	5/6-5/9	1160	1180	57.7	58.6	4	34.75	0.00	0.00	7.00	0.00	0.00	17.50	0.00	0.00
I-5 UPS RST	2	2/28-2/28	1410	983	43.1	43.1	1	15.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00
	3	3/4-3/7	1030	1060	43.5	47.3	4	22.00	0.00	0.00	0.00	0.25	0.00	0.00	0.75	0.00
	4	3/11-3/14	1150	1650	46.4	47.1	2	67.00	0.00	0.50	0.00	0.50	0.00	0.00	0.00	0.00
	5	3/18-3/21	1730	1880	46.5	48.0	4	17.00	0.00	0.25	0.00	0.25	29.00	0.00	0.50	0.00
	6	3/25-3/28	1420	1580	48.3	49.6	4	45.25	0.25	0.00	0.25	0.00	1.00	0.00	0.50	0.00
	7	4/1-4/4	1330	1350	46.0	50.5	4	59.50	0.00	0.00	0.50	0.00	0.25	0.00	0.25	0.00
	8	4/8-4/11	1360	1470	49.8	53.0	4	191.00	0.00	0.00	1.75	0.00	0.00	0.00	0.00	0.00
	9	4/15-4/18	1330	1330	52.7	55.4	4	296.25	0.00	0.00	6.50	0.00	0.00	0.25	0.00	0.00
	10	4/22-4/25	1330	1340	53.7	56.4	4	132.75	0.00	0.00	2.00	1.00	0.00	0.50	0.50	0.00
	11	4/29-5/1	1280	1330	59.7	61.7	3	60.33	0.00	0.00	0.00	0.00	0.33	1.00	0.33	0.00
	12	5/6-5/9	1160	1180	56.3	57.7	4	59.50	0.00	0.00	0.25	0.00	0.50	0.75	0.00	0.00
I-5 DNS RST	2	2/28-2/28	1410	983	43.1	43.1	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3	3/4-3/7	1030	1060	43.5	47.3	4	38.50	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00
	4	3/11-3/14	1150	1650	46.4	47.1	2	87.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00
	5	3/18-3/21	1730	1880	46.5	48.0	4	95.75	0.00	0.00	0.25	0.00	14.25	0.00	0.50	0.00
	6	3/25-3/28	1420	1580	48.3	49.6	4	303.25	0.00	0.00	1.00	0.00	2.00	0.00	0.75	0.00
	7	4/1-4/4	1330	1350	46.0	50.5	4	214.75	0.00	0.00	2.75	0.00	0.75	0.00	1.00	0.00
	8	4/8-4/11	1360	1470	49.8	53.0	4	425.50	0.00	0.00	8.50	0.00	0.00	0.00	0.00	0.00
	9	4/15-4/18	1330	1330	52.4	55.4	4	596.75	0.00	0.00	40.25	0.00	0.25	0.75	0.50	0.00
	10	4/22-4/25	1330	1340	53.7	56.4	4	391.00	0.00	0.00	20.75	0.00	0.25	10.00	0.50	0.00
	11	4/29-5/1	1280	1330	59.7	61.7	3	147.00	0.00	0.00	7.00	0.00	0.33	12.00	0.67	0.00
	12	5/6-5/9	1160	1180	56.3	57.7	4	46.50	0.00	0.00	1.50	0.00	0.00	1.00	0.25	0.00
I-5 Frame	1	2/20-2/21	1160	1240	40.6	40.8	1	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6	3/26-3/28	1420	1500	48.3	49.4	3	98.67	0.00	0.00	9.67	0.00	0.00	0.00	0.00	0.00
	7	4/1-4/4	1330	1350	46.0	50.5	2	101.00	0.00	0.00	15.00	0.00	0.50	0.00	0.00	0.00
Kinsman RST	2	2/27-2/28	1410	1667	45.1	46.9	2	112.50	0.00	0.00	0.00	6.00	0.00	0.00	2.50	0.00
	3	3/4-3/7	2092	2840	46.9	48.6	4	524.25	0.00	0.25	0.00	4.00	0.00	0.00	5.50	0.00
	5	3/18-3/21	2396	2529	47.5	50.1	4	1134.50	0.00	0.00	0.00	1.50	0.50	0.00	1.50	0.00
	6	3/25-3/28	2029	2173	48.7	51.4	4	898.00	0.00	0.00	24.25	0.25	0.00	0.00	0.75	0.00
	7	4/1-4/4	2049	2295	46.6	51.0	4	237.25	0.00	0.00	8.75	0.00	1.00	0.00	0.75	0.00
	8	4/8-4/11	1991	2134	54.0	57.0	3	350.33	0.00	0.00	10.00	0.00	1.33	0.00	0.33	0.00
	9	4/15-4/18	1780	1835	55.0	56.4	3	247.00	0.00	0.00	42.33	2.00	1.67	0.00	2.00	0.00
	10	4/22-4/25	1708	1727	54.8	56.4	4	304.25	0.00	0.00	36.25	0.50	0.50	0.25	2.50	0.00
	11	4/29-5/1	1659	1692	57.6	59.3	3	149.67	0.00	0.00	9.67	1.33	2.33	2.67	4.67	0.00
	12	5/6-5/9	1450	1540	56.4	59.1	3	61.00	0.00	0.00	7.67	0.00	0.33	0.33	5.00	0.00

Note: The frame net at the I-5 site has been in operation only intermittently due to flawed sets (net impacted by aquatic vegetation) and flows too high for the equipment.

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 mainstem Klamath River, 2014. Note that RST = rotary screw trap and YOY = young-of-the-year.

Preliminary data - Subject to revision

			YOY Chinook (natural) - fork length data								YOY coho - fork length data							
		2014	2014					Last 10 years			2014					Last 10 years		
Site	Calendar Week	sampling dates	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	8	Feb 19-20	39	35.1	29	40	0.0%	39	1	35.1	0	-	-	-	-	0	0	-
Frame	9	Feb 27	30	37.1	32	40	0.0%	30	1	37.1	0	-	-	-	-	0	0	-
	10	Mar 4-6	90	37.7	32	42	0.0%	210	3	36.9	0	-	-	-	-	0	0	-
	11	Mar 11-13	90	36.9	31	42	0.0%	592	9	37.1	0	-	-	-	-	2	1	34.0
	12	Mar 18-20	90	37.5	32	43	0.0%	938	10	37.4	10	34.0	32	35	0.0%	116	4	34.8
	13	Mar 25-27	90	37.7	33	43	0.0%	923	9	37.7	85	34.2	29	38	0.0%	134	5	34.5
	14	Apr 1-3	90	37.2	33	42	0.0%	960	10	37.6	89	34.2	30	40	0.0%	342	9	34.8
	15	Apr 8-10	90	37.5	33	45	0.0%	810	9	37.8	90	34.8	30	38	0.0%	390	9	34.6
	16	Apr 15-17	90	37.1	32	48	0.0%	909	9	38.2	90	34.1	28	38	0.0%	667	9	34.7
	17	Apr 22-24	90	38.0	34	53	0.0%	906	10	40.2	90	34.8	32	41	0.0%	540	10	35.4
	18	Apr 29-May 1	90	40.3	33	62	1.1%	939	10	42.8	54	37.6	32	52	0.0%	440	9	36.2
Klamathon	10	Mar 6	1	37.0	37	37	0.0%	2	2	39.5	0	-	-	-	-	0	0	-
Seine	11	Mar 13	30	39.4	35	42	0.0%	71	3	40.0	0	-	-	-	-	0	0	-
	12	Mar 20	30	39.4	35	45	0.0%	176	9	38.5	0	-	-	-	-	0	0	-
	13	Mar 27	30	41.8	36	48	0.0%	165	8	40.6	0	-	-	-	-	0	0	-
	14	Apr 3	30	41.6	36	48	0.0%	148	8	40.6	0	-	-	-	-	1	1	42.0
	15	Apr 10	30	44.0	34	60	3.3%	219	8	40.8	1	33.0	33	33	0.0%	1	1	33.0
	16	Apr 17	30	40.8	35	52	0.0%	197	8	41.0	4	34.3	33	35	0.0%	4	1	34.3
	17	Apr 24	30	42.0	34	54	0.0%	226	10	44.1	2	34.0	34	34	0.0%	2	1	34.0
	18	May 1	30	47.3	37	63	13.3%	247	9	48.1	0	-	-	-	-	2	1	46.5
I-5	10	Mar 4-6	90	38.2	30	43	0.0%	120	2	38.0	0	-	-	-	-	0	0	-
RST's	11	Mar 11	29	38.8	34	43	0.0%	310	8	37.2	0	-	-	-	-	0	0	-
	12	Mar 18-20	90	38.6	35	46	0.0%	422	9	37.9	0	-	-	-	-	0	0	-
	13	Mar 25-27	90	38.5	31	48	0.0%	526	8	37.9	1	35.0	35	35	0.0%	4	2	35.7
	14	Apr 1-3	89	38.5	32	53	0.0%	558	8	38.3	5	34.0	33	35	0.0%	6	2	34.5
	15	Apr 8-10	90	39.4	33	57	2.2%	550	8	39.3	24	34.3	32	37	0.0%	29	4	34.9
	16	Apr 15-17	90	40.0	34	58	3.3%	598	8	40.4	85	33.8	30	45	0.0%	108	7	34.2
	17	Apr 22-24	90	41.9	33	59	3.3%	576	8	43.6	62	35.9	31	72	6.5%	85	6	35.5
	18	Apr 29-May 1	90	43.9	34	68	10.0%	555	9	47.7	19	34.1	31	45	0.0%	21	3	35.4
I-5	8	Feb 20	3	37.7	37	39	0.0%	3	1	37.7	0	-	-	-	-	0	0	-
Frame	9	-	0	-	-	-	-	0	0	-	0	-	-	-	-	0	0	-
	10	-	0	-	-	-	-	0	0	-	0	-	-	-	-	0	0	-
	11	-	0	-	-	-	-	131	5	37.6	0	-	-	-	-	0	0	-
	12	-	0	-	-	-	-	384	8	37.5	0	-	-	-	-	18	3	33.7
	13	Mar 26-27	60	38.5	34	48	0.0%	447	8	38.3	16	33.6	33	35	0.0%	44	6	35.2
	14	Apr 1-3	90	37.7	33	46	0.0%	510	8	38.8	44	34.2	32	37	0.0%	56	7	35.1
	15	-	0	-	-	-	-	402	5	39.4	0	-	-	-	-	88	5	35.0
	16	-	0	-	-	-	-	533	6	40.7	0	-	-	-	-	98	6	35.3
	17	-	0	-	-	-	-	371	6	42.9	0	-	-	-	-	82	6	35.3
	18	-	0	-	-	-	-	390	7	43.6	0	-	-	-	-	104	5	38.6
Kinsman	9	Feb 27	30	37.4	33	41	0.0%	30	1	37.4	0	-	-	-	-	0	0	-
RST	10	Mar 4-6	90	37.6	33	50	0.0%	104	2	38.9	0	-	-	-	-	0	0	-
	11	Mar 12-13	60	40.0	33	49	0.0%	286	8	39.7	0	-	-	-	-	0	0	-
	12	Mar 18-20	90	41.4	31	64	2.2%	508	9	41.6	0	-	-	-	-	4	2	35.3
	13	Mar 25-27	90	40.5	30	58	2.2%	582	7	43.5	56	33.3	30	38	0.0%	85	3	35.2
	14	Apr 1-3	90	39.0	32	60	2.2%	656	9	45.7	22	32.6	31	36	0.0%	65	8	35.4
	15	Apr 9-10	60	45.2	33	73	8.3%	618	9	47.3	16	33.4	31	36	0.0%	62	7	35.0
	16	Apr 15-16	59	48.4	35	65	20.3%	675	9	51.7	43	32.3	29	35	0.0%	130	6	33.3
	17	Apr 22-24	90	46.0	37	65	8.9%	677	10	52.1	84	33.8	30	44	0.0%	104	6	37.2
	18	Apr 29-May 1	89	47.2	33	67	15.7%	564	9	58.5	29	34.7	30	50	0.0%	53	7	39.0

Note: The frame net at the I-5 site has been in operation only intermittently due to flawed sets (net impacted by aquatic vegetation) and 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 mainstem Klamath River, 2014. *Note: Altough only Chinook salmon are reported in this table, we do monitor clinical signs of diseases in coho salmon and other species as well. We have not observed any clinical signs of disease in coho salmon so far this season.*

Preliminary Data - Subject to Revision

						Belly Condition			Gills				
										Color		Condition	
			Weekly	Water Temp. (F) [b]		Sample	Distended		Sample	Pale or Worse		Eroded or Fungal	
Site	Calendar Week	Sampling Dates	Mean Flow (cfs) [a]	Min	Max	Size	n	%	Size	n	%	n	%
Bogus	8	Feb 19-20	1130	40.8	41.1	12	0	0.0%	0	-	-	-	-
	9	Feb 27	1149	43.3	43.3	24	0	0.0%	0	-	-	-	-
	10	Mar 4-6	1040	44.2	45.3	77	0	0.0%	0	-	-	-	-
	11	Mar 11-13	1399	46.2	46.4	62	0	0.0%	0	-	-	-	-
	12	Mar 18-20	1807	46.9	48.7	82	0	0.0%	0	-	-	-	-
	13	Mar 25-27	1569	48.9	49.4	89	0	0.0%	0	-	-	-	-
	14	Apr 1-3	1380	48.3	49.4	90	0	0.0%	0	-	-	-	-
	15	Apr 8-10	1391	51.9	53.2	90	0	0.0%	1	0	0.0%	0	0.0%
	16	Apr 15-17	1329	53.9	55.0	90	0	0.0%	3	1	33.3%	0	0.0%
	17	Apr 22-24	1330	53.9	56.3	90	0	0.0%	4	0	0.0%	0	0.0%
	18	Apr 29-May 1	1286	56.6	58.2	90	0	0.0%	14	1	7.1%	1	7.1%
	19	May 6-8	1184	57.9	58.6	74	0	0.0%	28	1	3.6%	0	0.0%
Klamathon	10	Mar 6	1040	-	-	1	0	0.0%	0	-	-	-	-
	11	Mar 13	1399	47.3	47.3	25	0	0.0%	0	-	-	-	-
	12	Mar 20	1807	52.0	52.0	29	0	0.0%	1	0	0.0%	0	0.0%
	13	Mar 27	1569	49.6	49.6	30	0	0.0%	4	0	0.0%	0	0.0%
	14	Apr 3	1380	50.3	50.3	30	0	0.0%	5	0	0.0%	0	0.0%
	15	Apr10	1391	55.4	55.4	30	0	0.0%	11	0	0.0%	0	0.0%
	16	Apr 17	1329	56.4	56.4	30	0	0.0%	4	0	0.0%	0	0.0%
	17	Apr 24	1330	56.8	56.8	30	0	0.0%	4	0	0.0%	0	0.0%
	18	May 1	1286	59.1	59.1	30	0	0.0%	19	3	15.8%	0	0.0%
	19	May 8	1184	-	-	30	0	0.0%	10	0	0.0%	0	0.0%
I-5	8	Feb 20	1130	40.8	40.8	2	0	0.0%	0	-	-	-	-
	10	Mar 4-6	1040	43.5	47.3	79	0	0.0%	0	-	-	-	-
	11	Mar 11	1399	46.4	46.4	26	0	0.0%	0	-	-	-	-
	12	Mar 18-20	1807	46.5	48.0	88	0	0.0%	4	1	25.0%	0	0.0%
	13	Mar 25-27	1569	48.3	49.6	149	0	0.0%	3	0	0.0%	0	0.0%
	14	Apr 1-3	1380	46.0	50.5	180	0	0.0%	11	1	9.1%	0	0.0%
	15	Apr 8-10	1391	49.8	52.5	90	0	0.0%	11	0	0.0%	0	0.0%
	16	Apr 15-17	1329	52.7	55.4	90	0	0.0%	13	0	0.0%	0	0.0%
	17	Apr 22-24	1330	53.7	56.4	90	0	0.0%	20	0	0.0%	0	0.0%
	18	Apr 29-May 1	1286	59.7	61.7	90	0	0.0%	27	0	0.0%	0	0.0%
	19	May 6-8	1184	56.3	57.7	90	0	0.0%	55	0	0.0%	1	1.8%
Kinsman	9	Feb 27	1746	46.9	46.9	27	0	-	0	-	-	-	-
	10	Mar 4-6	2195	48.0	48.6	90	0	0.0%	5	0	0.0%	0	0.0%
	11	Mar 12-13	3356	45.3	47.1	60	0	0.0%	12	3	25.0%	0	0.0%
	12	Mar 18-20	2494	47.5	49.1	90	0	0.0%	25	1	4.0%	0	0.0%
	13	Mar 25-27	2301	48.7	51.4	87	0	0.0%	20	0	0.0%	0	0.0%
	14	Apr 1-3	2251	46.6	50.5	90	0	0.0%	12	0	0.0%	0	0.0%
	15	Apr 9-10	2022	54.0	55.0	60	0	0.0%	27	0	0.0%	0	0.0%
	16	Apr 15-16	1809	55.9	56.4	60	0	0.0%	38	0	0.0%	0	0.0%
	17	Apr 22-24	1721	54.8	55.7	90	0	0.0%	46	0	0.0%	0	0.0%
	18	Apr 29-May 1	1650	57.6	59.3	90	0	0.0%	53	8	15.1%	0	0.0%
	19	May 6-8	1504	56.4	59.1	60	6	10.0%	40	15	37.5%	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)

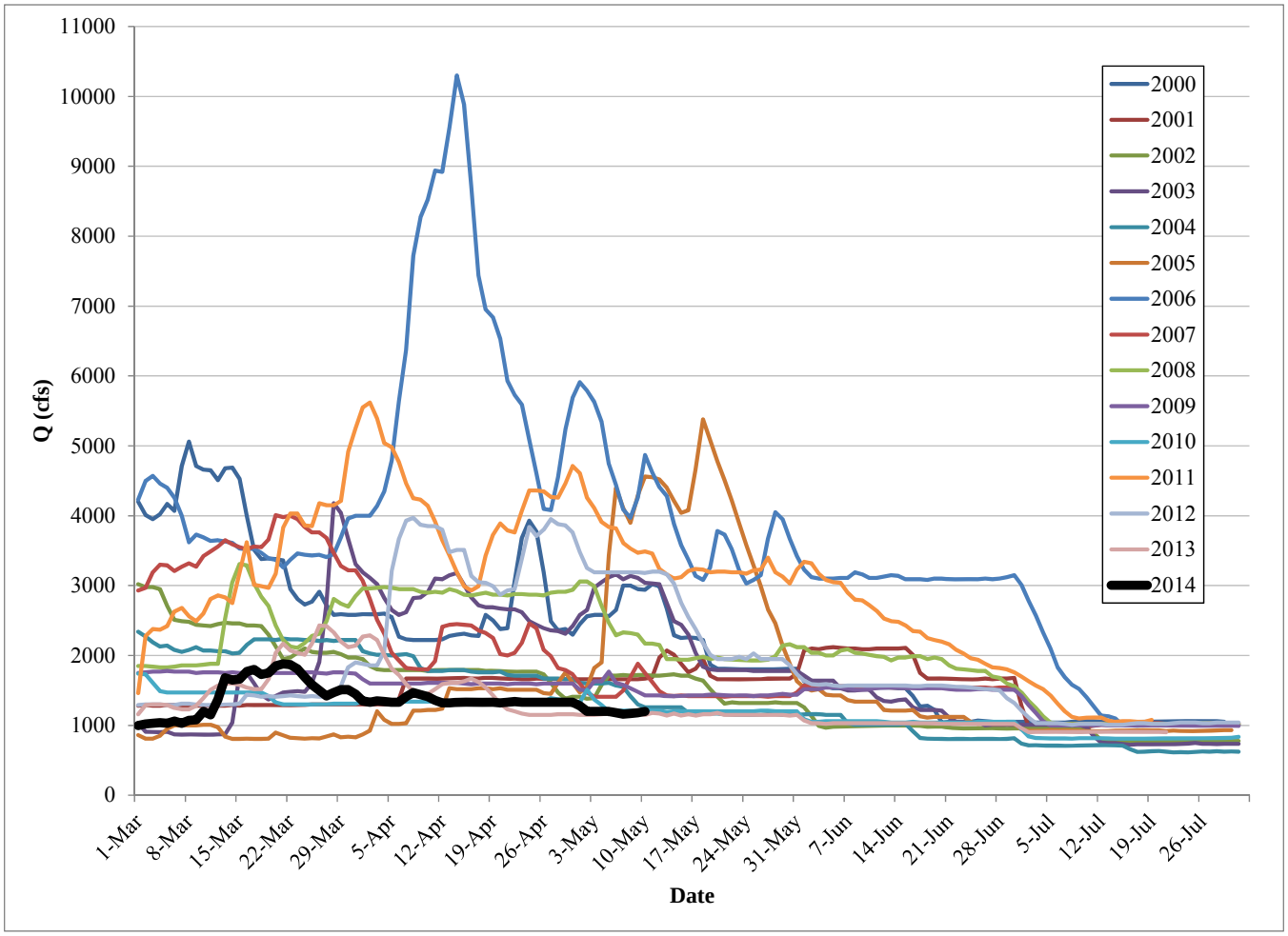

Figure 1. Daily mean discharge below Iron Gate Dam, Klamath River (USGS Gaging Station 11516530) from March through July, 2000 to 2014.

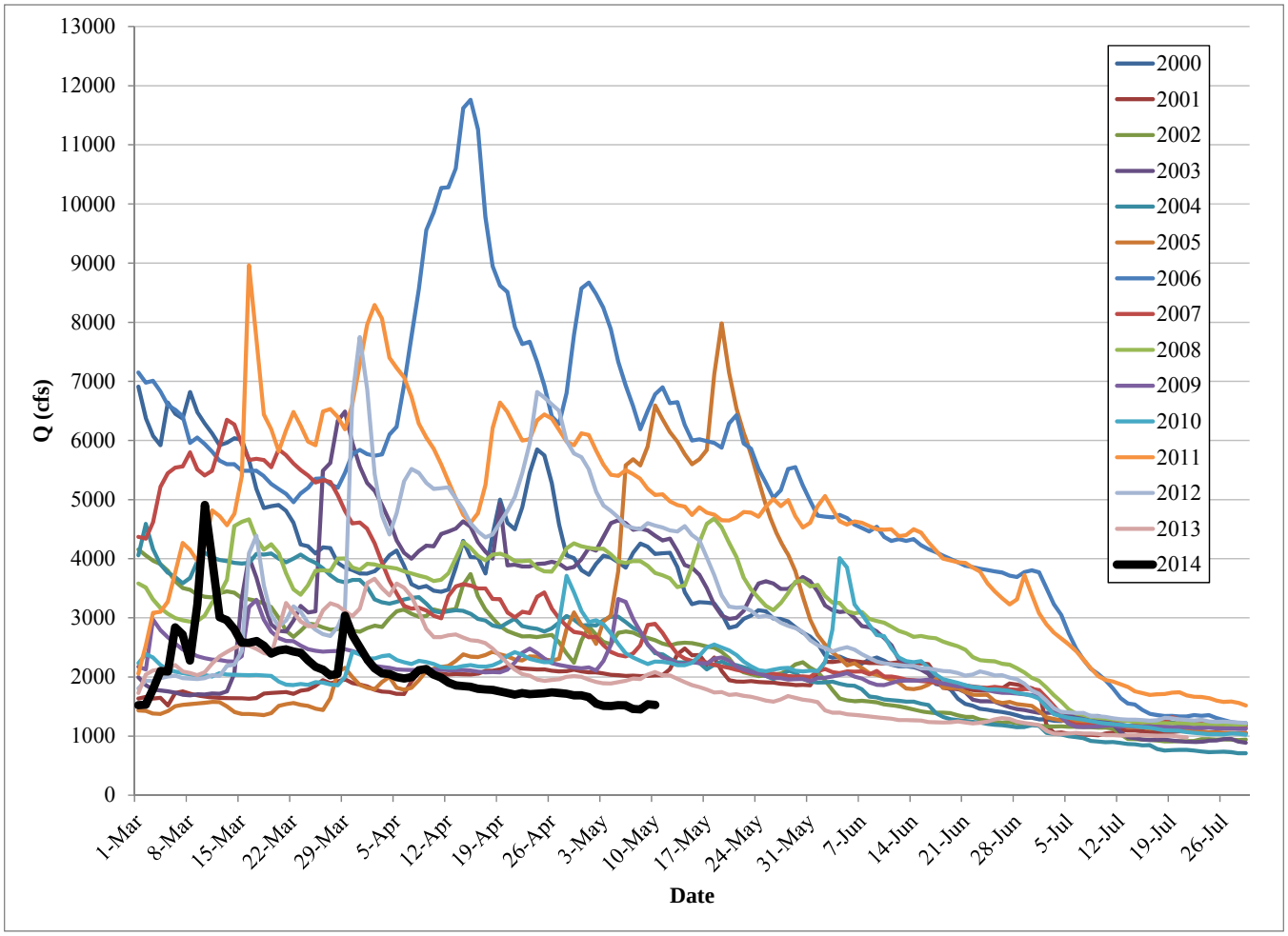

Figure 2. Klamath River daily mean discharge at the Kinsman Trap Site from March through July, 2000 to 2014. Flow measurements are not available at this location. Therefore Klamath River flow near Seiad Valley, CA (USGS Gaging Station 11520500) minus flow from the Scott River near Fort Jones, CA (USGS 11511950) is used as a surrogate.