U.S. Fish & Wildlife Service

Arcata Fish & Wildlife Office Fisheries Program

# Klamath River Outmigrant Monitoring Update – April 14, 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 |
| 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 |
| 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 |
| 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 | 2406 | 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 | 2042 | 2187 | 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 | 2076 | 2310 | 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 | 2022 | 2165 | 54.0 | 57.0 | 3 | 350.33 | 0.00 | 0.00 | 10.00 | 0.00 | 1.33 | 0.00 | 0.33 | 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 |
| 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 |
| 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 |
| 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 |
| 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 |

*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.

Preliminary Data - Subject to Revision

| | | | | | | Belly Condition | | | Gills | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Color | | Condition | |
| | Calendar | Sampling | Weekly Mean | Water Temp. (F) [b] | | Sample | Distended | | Sample | Pale or Worse | | Eroded or Fungal | |
| Site | Week | Dates | 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% |
| 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% |
| 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% |
| Kinsman | 9 | Feb 27 | 1749 | 46.9 | 46.9 | 27 | 0 | - | 0 | - | - | - | - |
| | 10 | Mar 4-6 | 2356 | 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 | 2500 | 47.5 | 49.1 | 90 | 0 | 0.0% | 25 | 1 | 4.0% | 0 | 0.0% |
| | 13 | Mar 25-27 | 2312 | 48.7 | 51.4 | 87 | 0 | 0.0% | 20 | 0 | 0.0% | 0 | 0.0% |
| | 14 | Apr 1-3 | 2268 | 46.6 | 50.5 | 90 | 0 | 0.0% | 12 | 0 | 0.0% | 0 | 0.0% |
| | 15 | Apr 9-10 | 2050 | 54.0 | 55.0 | 60 | 0 | 0.0% | 27 | 0 | 0.0% | 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)

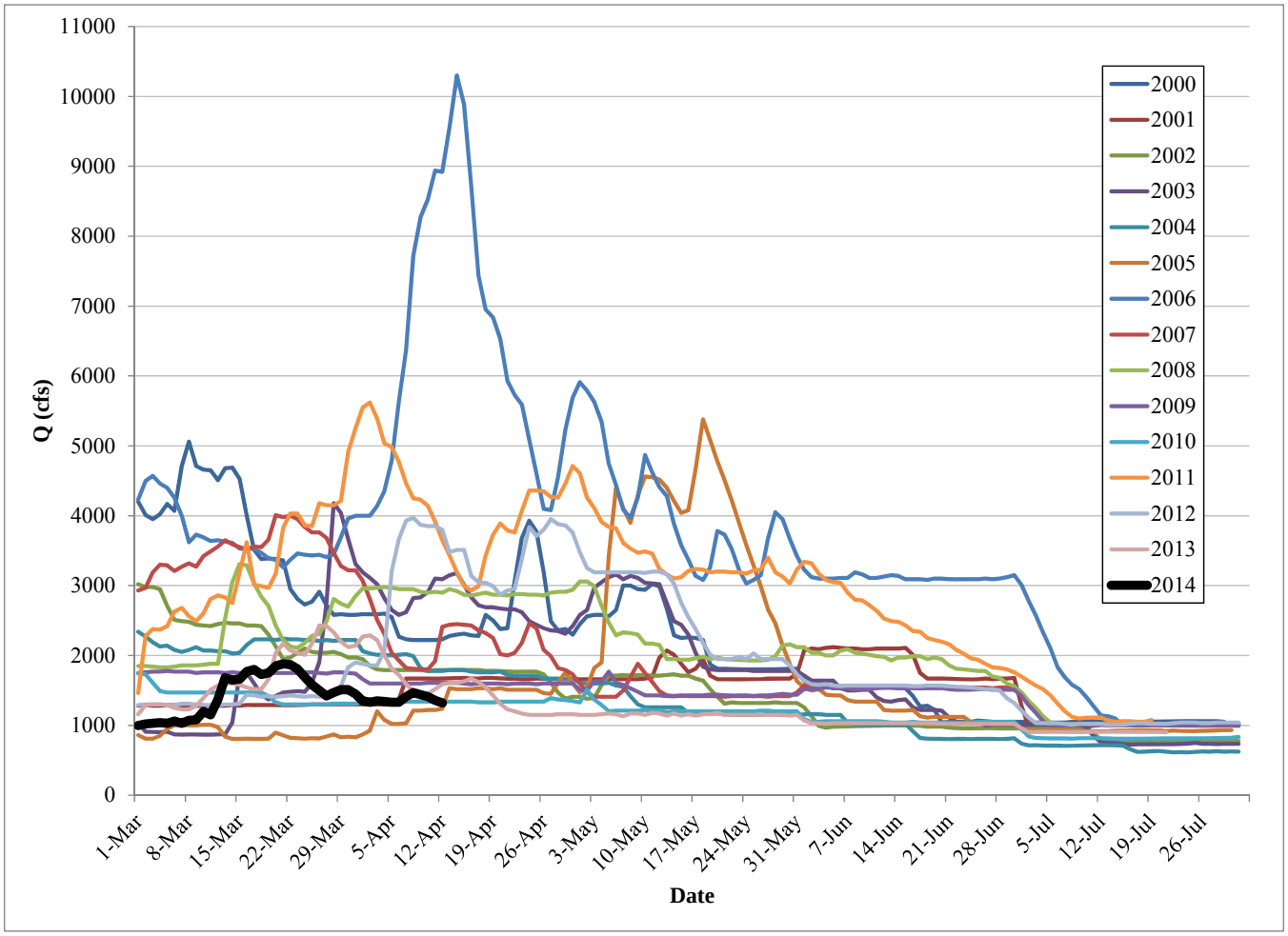


Figure 1. Daily mean discharge below Iron Gate Dam, Klamath River (USGS Gaging Station 11516530) from March through July, 2000 to 2014.

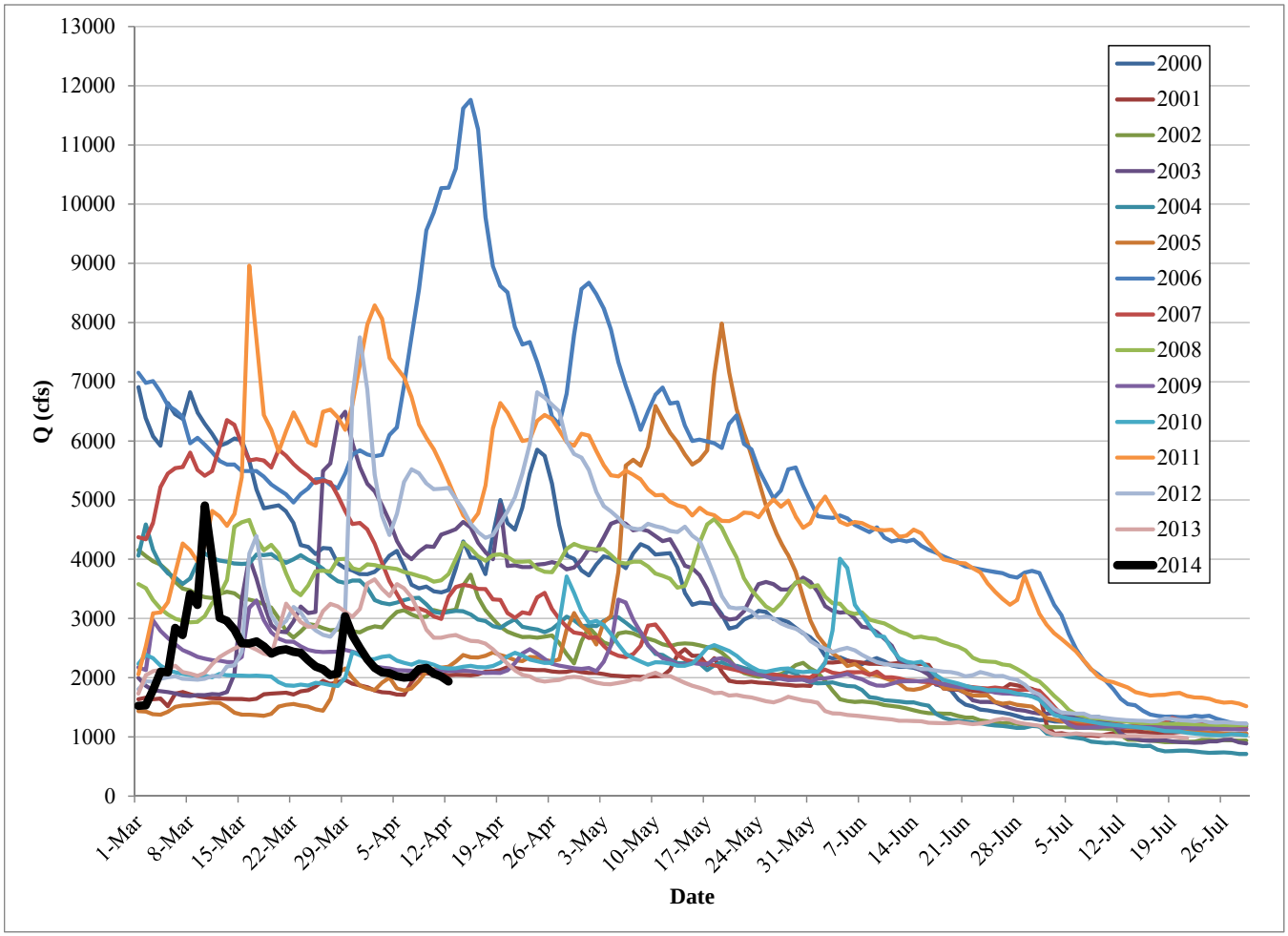


Figure 2. Klamath River daily mean discharge at the Kinsman Trap Site from March through July, 2000 to 2014. Flow measurements are not available at this location. Therefore Klamath River flow near Seiad Valley, CA (USGS Gaging Station 11520500) minus flow from the Scott River near Fort Jones, CA (USGS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