

MEMORANDUM

DATE: August 7, 2017

TO: Nick Hetrick, Arcata FWO,
FASTA

FROM: Kimberly True
CA-NV Fish Health Center
(530) 356-4271 Ext. 201
Kimberly_True@fws.gov

SUBJECT: 2017 Klamath River Juvenile Chinook Salmon Health Monitoring,
Ceratonova shasta and *Parvicapsula minibicornis* Prevalence Data

As a component of Klamath River fish health assessment, the California-Nevada Fish Health Center is examining juvenile Klamath River Chinook salmon to monitor the prevalence of *Ceratonova shasta* and *Parvicapsula minibicornis* infection. Fish are collected by biologists with the Karuk Tribe, Yurok Tribe, and US Fish and Wildlife Service. The CA-NV Fish Health Center is coordinating disease monitoring efforts and providing laboratory support for the project.

To date, QPCR testing has been performed for all natural fish collected from March 26 through May 28 in the upper Shasta to Scott (K4) reach, and April 9 through May 28 in the Scott to Salmon (K3) reach. Natural fish collected in K4 were monitored in real time for the first 8 weeks of the season, in order to provide managers with weekly *C. shasta* prevalence of infection (POI) data. Natural fish tested negative for *C. shasta* the first 5 weeks of monitoring in K4, and the first parasite detection occurred the week of April 30. The highest *C. shasta* POI (20%) in natural fish occurred the weeks of May 14 and 28 (Figure 2).

QPCR testing of mixed origin (natural and/or hatchery) juvenile Chinook continued for 7-8 weeks in the upper reaches, following Iron Gate Hatchery release on May 26 (Figure 2 and 3). Mixed origin fish were collected from the lower Salmon to Trinity (K2) and Trinity to Estuary (K1) reaches in June and July (Figure 4 and 5). Coded-wire tagged juvenile Chinook were difficult to collect in all reaches due to the limited number released by Iron Gate Hatchery.

Overall, *Ceratonova shasta* has been detected in 19% (178/931) of all fish tested to date and *Parvicapsula minibicornis* has been detected in 60% (560/931). *Ceratonova shasta* prevalence of infection has been low, very few clinically diseased fish have been observed, and parasite load (*C. shasta* DNA copy number) is extremely low.

All data is preliminary and subject to revision. The graphs were intentionally kept in a similar sampling week format, to allow viewers to see prevalence over the temporal scale, however sampling begin/end dates vary by reach. Sample period and any weeks with negative test results are noted in the graph captions. The next monthly update will occur in early September and include fish collected from the Klamath Estuary.

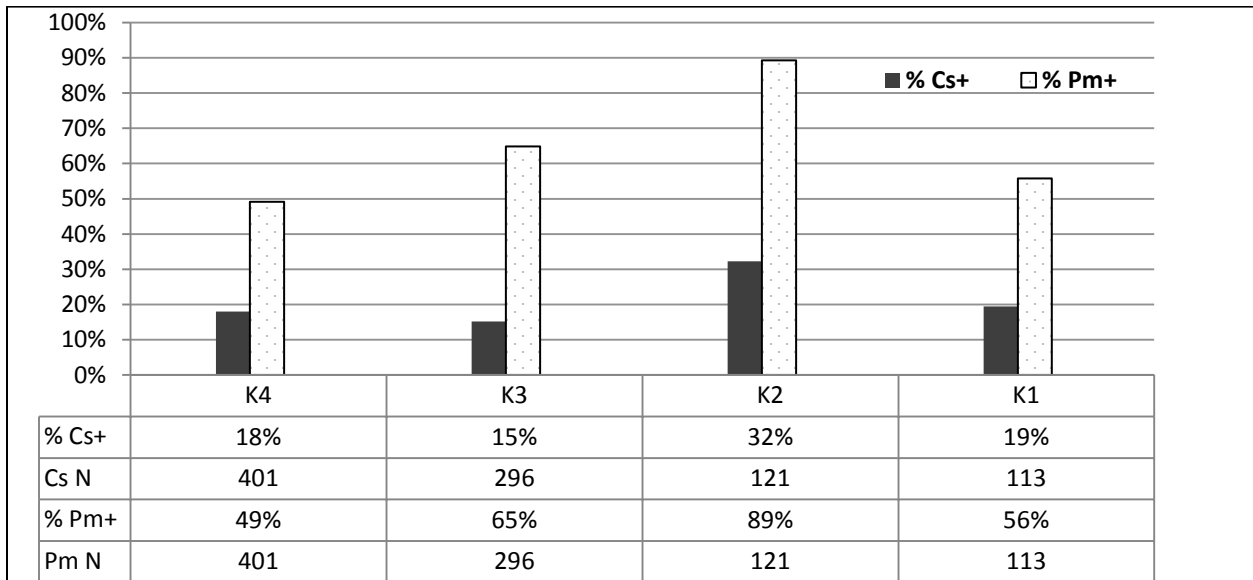


Figure 1. *Ceratonova shasta* and *Parvicapsula minibicornis* prevalence of infection (POI) by sampling reach. Percent positive by Quantitative Polymerase Chain Reaction (QPCR) testing.

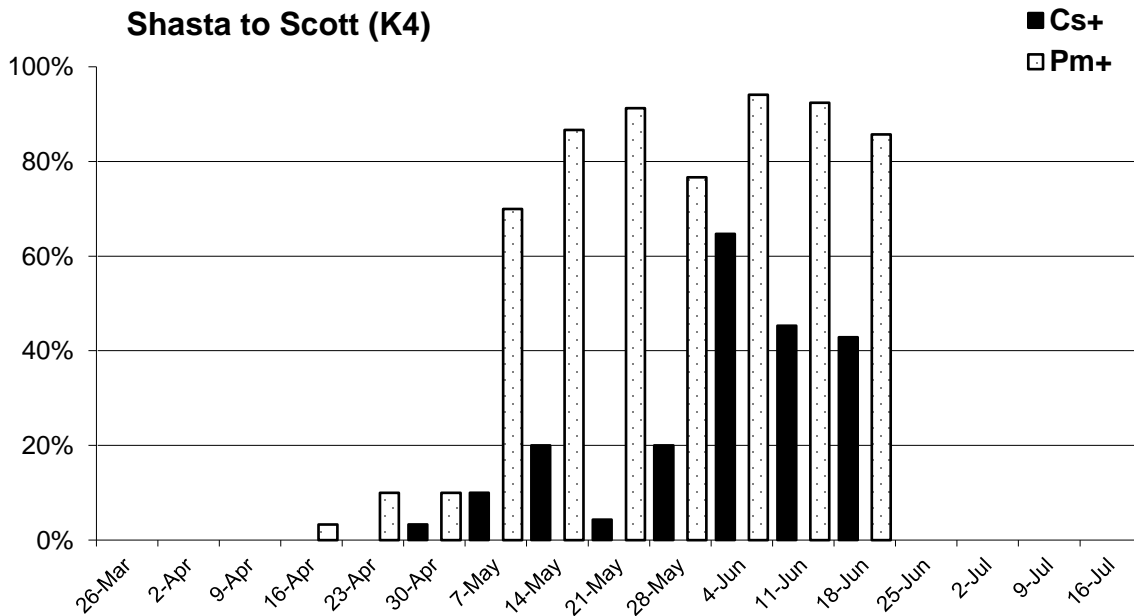


Figure 2. Weekly prevalence of *Ceratonova shasta* and *Parvicapsula minibicornis* infection in juvenile Chinook salmon captured in the Shasta to Scott (K4) reach on the Klamath River. Thirty natural fish were sampled weekly from March 26 to May 28. Iron Gate Hatchery release occurred May 26. All fish tested negative for *C. shasta* the first five weeks of sampling: the first detection occurred week of Apr 30.

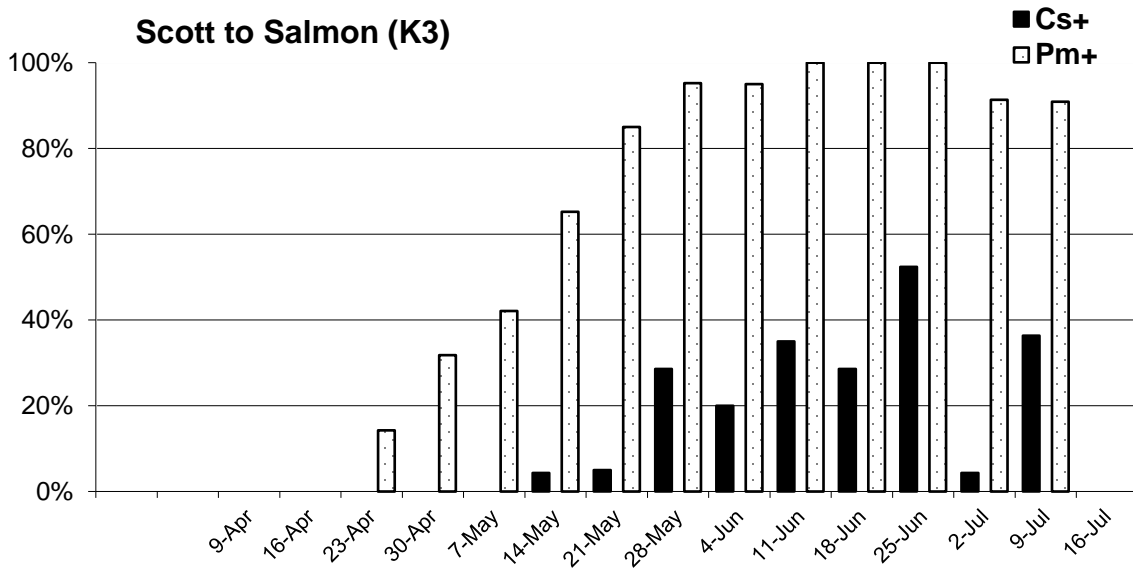


Figure 3. Weekly prevalence of *Ceratonova shasta* and *Parvicapsula minibicornis* infection in juvenile Chinook salmon captured in the Scott to Salmon (K3) reach on the Klamath River. Approximately twenty fish were sampled each week, commencing the week of April 9. All fish tested negative for *C. shasta* the first five weeks of sampling: the first detection occurred week of May 14. Sampling concluded in the reach the week of July 9. *Parvicapsula minibicornis* was also negative for the first two weeks: first detection occurred April 23.

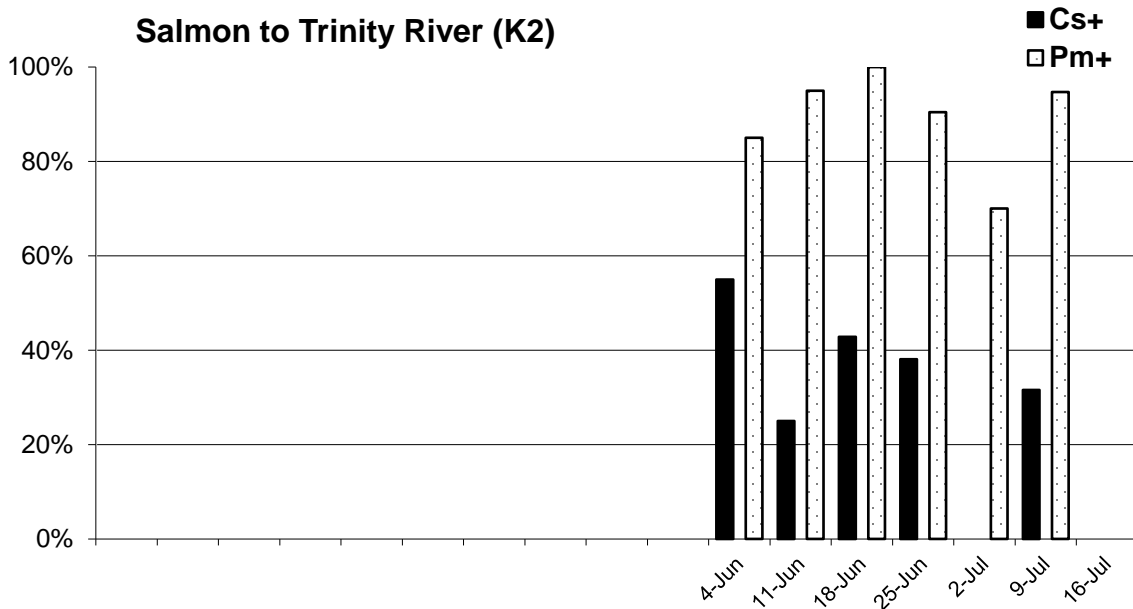


Figure 4. Weekly prevalence of *Ceratonova shasta* and *Parvicapsula minibicornis* infection in juvenile Chinook salmon captured in the Salmon to Trinity (K2) reach on the Klamath River. Approximately twenty fish were sampled each week, commencing the week of June 4. Samples collected the week of July 2 were negative for *C. shasta*. Final samples for this reach (week of July 16 and 23) are pending.

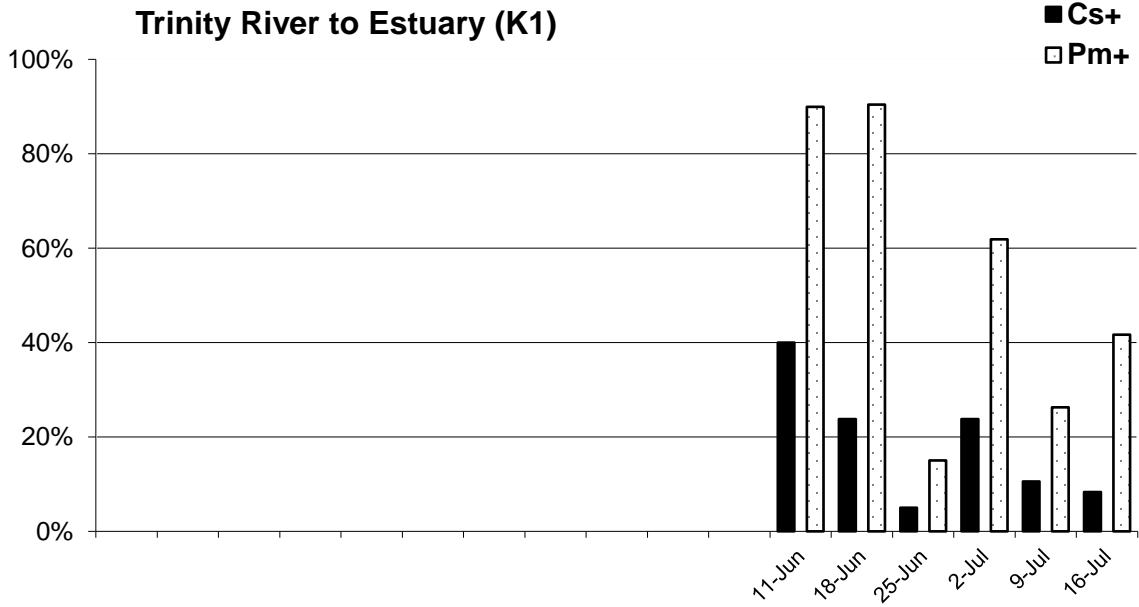


Figure 5. Weekly prevalence of *Ceratonova shasta* and *Parvicapsula minibicornis* infection in juvenile Chinook salmon captured in the Trinity to Estuary (K1) reach on the Klamath River. Approximately twenty fish were sampled each week, commencing the week of June 11. Samples collected through the week of August 6 are pending.