

MEMORANDUM

DATE: September 9, 2013

TO: Nick Hetrick, Arcata FWO

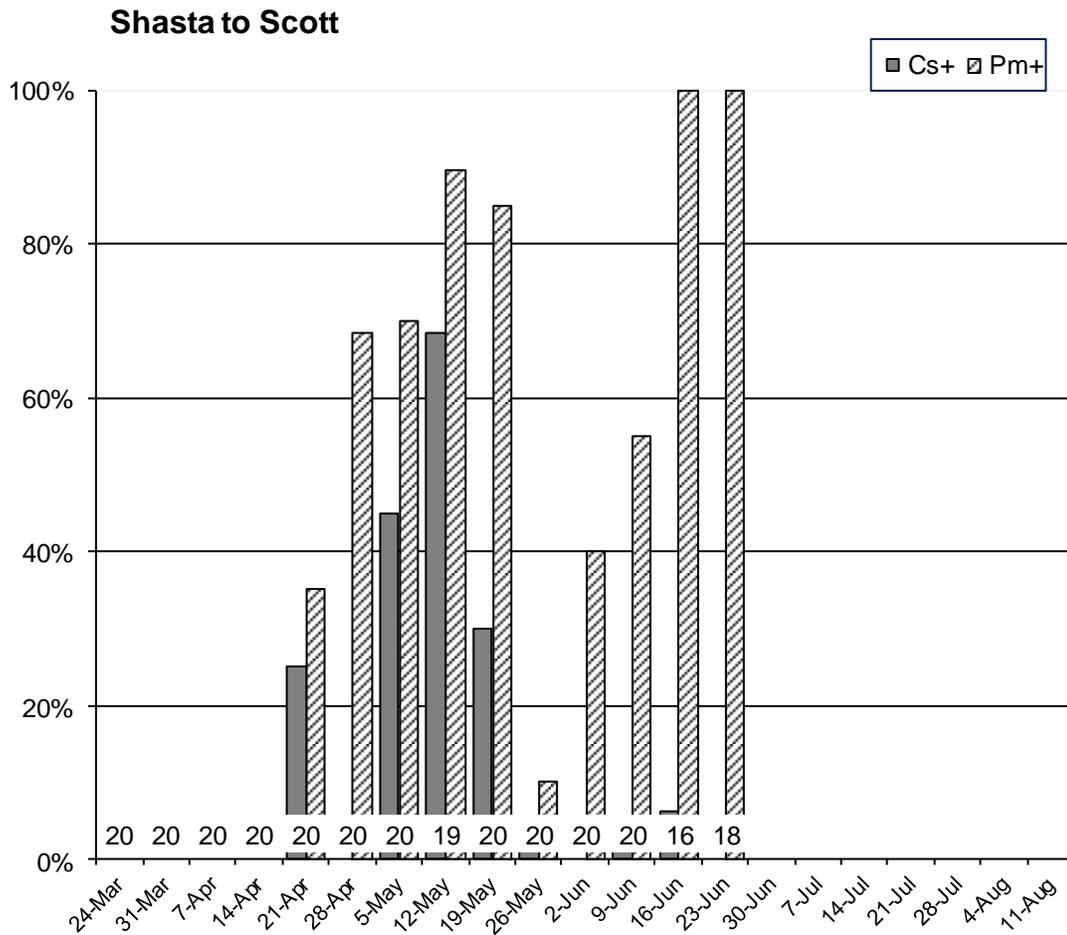
FROM: Kimberly True
CA-NV Fish Health Center
(530) 356-4271 Ext. 201
Kimberly_True@fws.gov

SUBJECT: 2013 Klamath River Juvenile Chinook Salmon Health Monitoring

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

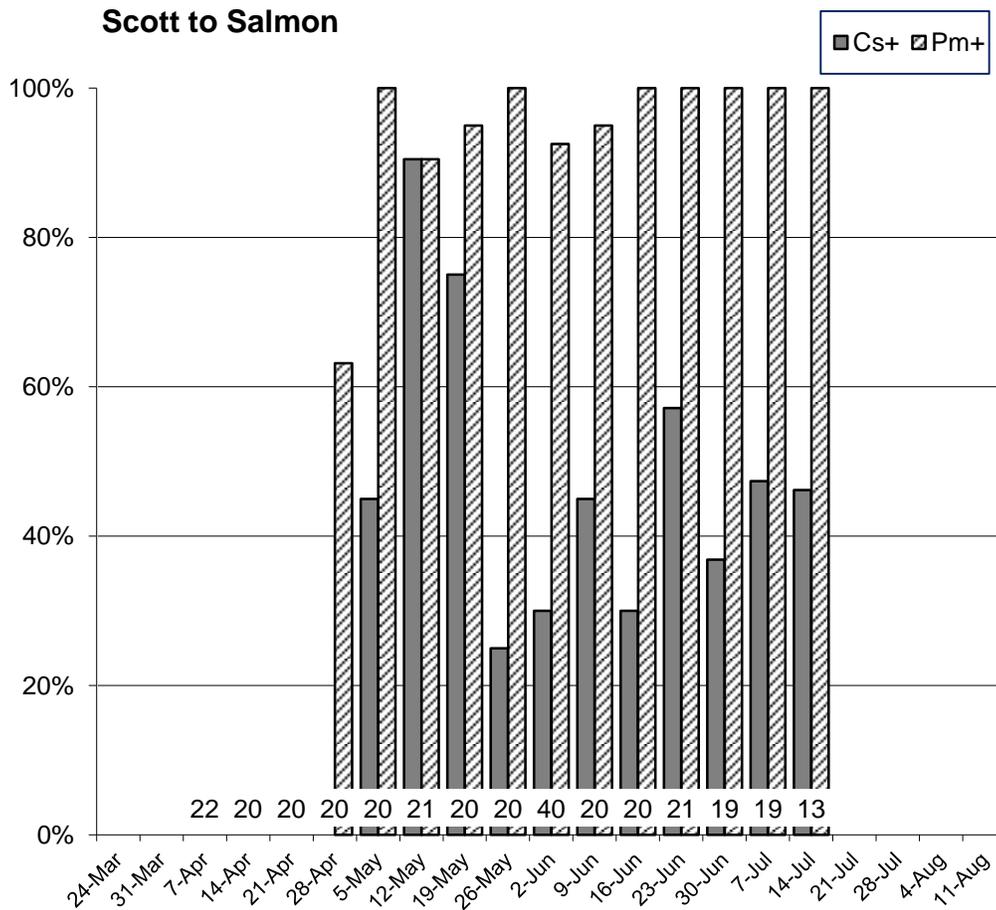
QPCR testing has been performed for fish collected this season, from March through June for the Shasta to Scott (K4) reach, from April through July for the Scott to Salmon (K3), Salmon to Trinity (K2), and Trinity to Estuary (K1) reaches, and early July through mid-August for the estuary (K0). Iron Gate Hatchery released juvenile Fall Chinook salmon on May 22nd.

Ceratomyxosis clinical disease signs were first observed in juvenile Chinook salmon collected from the Shasta to Scott (K4) reach in mid-May (natural fish) and in mid-June (hatchery origin); however prevalence of clinically infected juveniles has been low this year. ***Ceratomyxa shasta* has been detected in 34.1%** (305/894) of Chinook salmon tested. Columnaris clinical disease signs were first observed in juvenile Chinook salmon collected from the Scott to Salmon (K3) reach in early June; severity of infection was low by gross examination. ***Parvicapsula minibicornis* has been detected in 69.3%** (596/860) of Chinook salmon tested. Weekly myxozoan parasite prevalence of infection (POI) data are summarized by sample week in the figures below: *C. shasta* is shown in Figures and Tables 1-5, *P. minibicornis* is shown in Figures 1-5 (not shown in tables). Overall *C. shasta* POI is given for each reach. All data are preliminary and subject to revision.



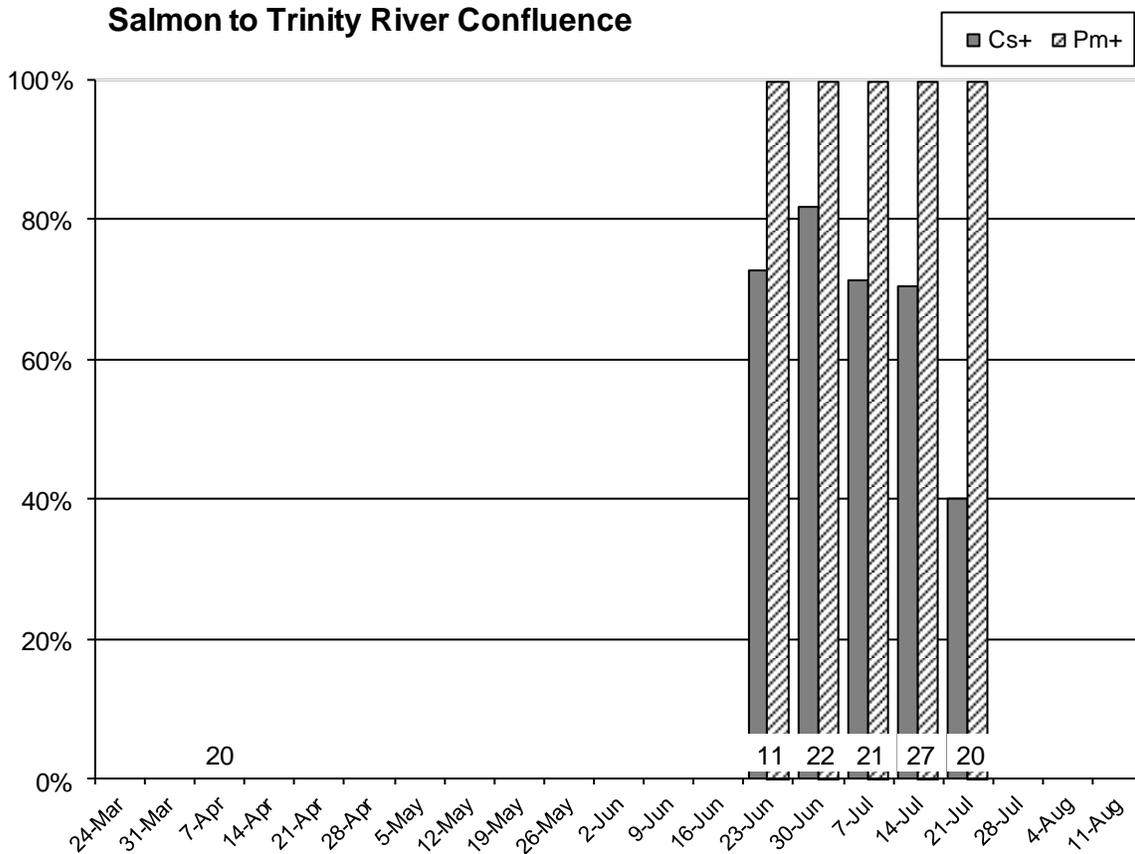
Weekly Date	Total Number of Samples (N)	Number Cs Positive
24 Mar	20	0
31 Mar	20	0
7 Apr	20	0
14 Apr	20	0
21 Apr	20	5
28 Apr	20	0
5 May	20	9
12 May	19	13
19 May	20	6
26 May	20	1
2 Jun	20	0
9 Jun	20	1
16 Jun	16	1
23 Jun	18	0

Figure 1/Table 1. Weekly prevalence of *Ceratomyxa shasta* and *Parvicapsula minibicornis* infection (Figure 1 only) in juvenile Chinook salmon captured in the Shasta to Scott (K4) reach on the Klamath River. *C. shasta* POI for this reach is 13.2% (36+/273).



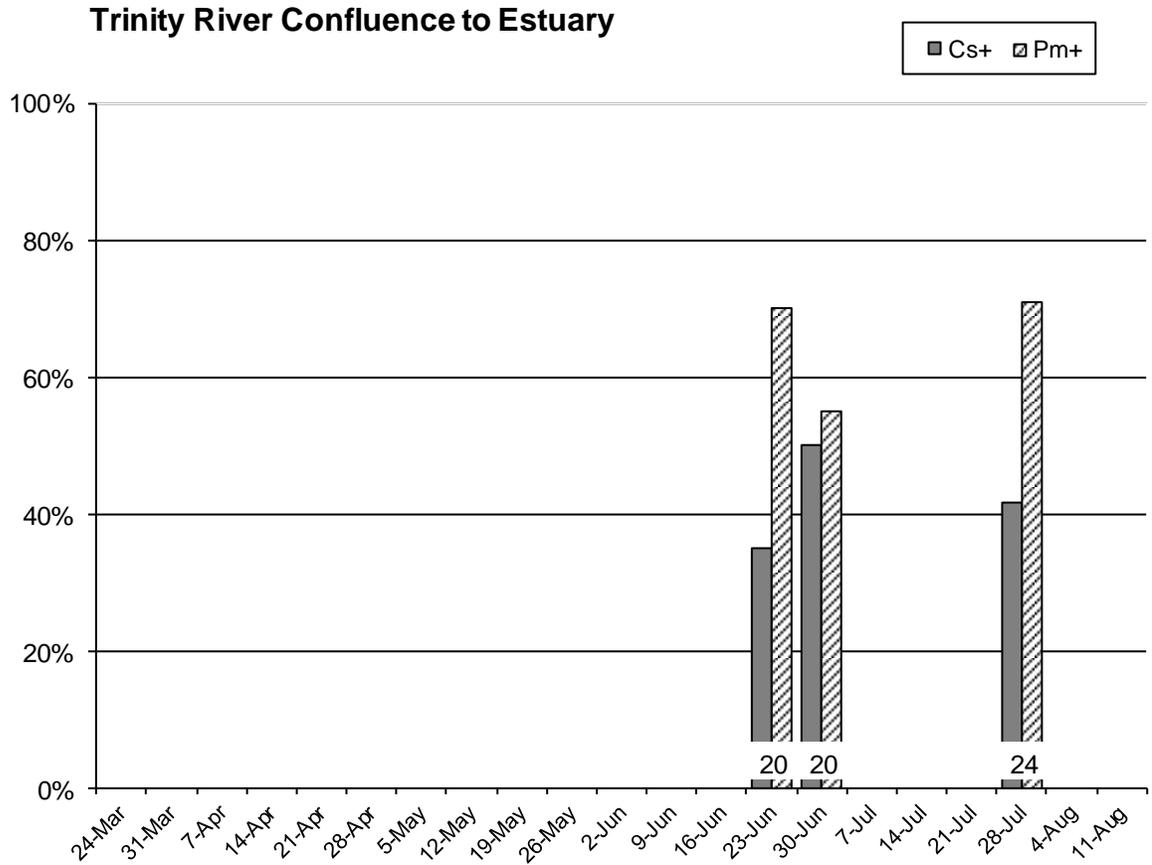
Weekly Date	Total Number of Samples (N)	Number Cs Positive
7 Apr	22	0
14 Apr	20	0
21 Apr	20	0
28 Apr	20	0
5 May	20	9
12 May	21	19
19 May	20	15
26 May	20	5
2 Jun	40	12
9 Jun	20	9
16 Jun	20	6
23 Jun	21	12
30 Jun	19	7
7 Jul	19	9
14 Jul	13	6

Figure 2/Table 2. Weekly prevalence of *Ceratomyxa shasta* infection and *Parvicapsula minibicornis* infection (Figure 2 only) in juvenile Chinook salmon captured in the Scott to Salmon (K3) reach on the Klamath River. *C. shasta* POI for this reach is 34.6% (109+/315).



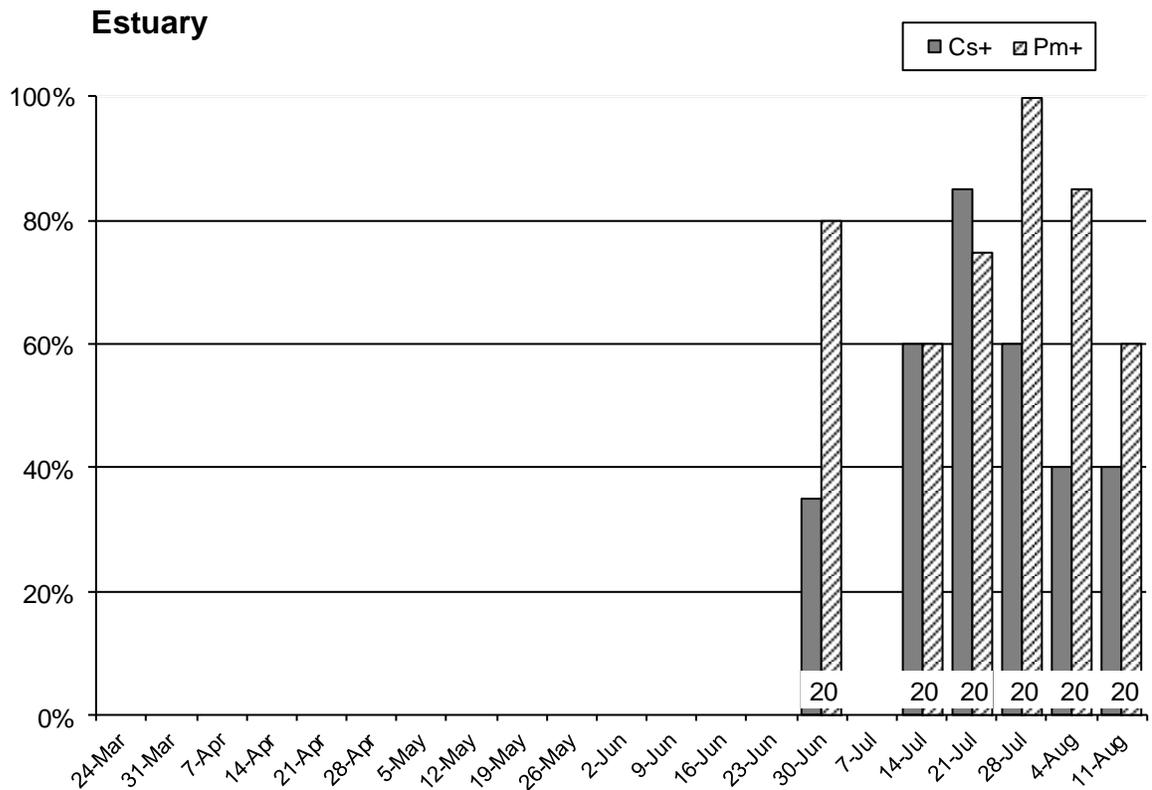
Weekly Date	Total Number of Samples (N)	Number Cs Positive
7 Apr	20	0
16-Jun	1	1
23-Jun	11	8
30 Jun	22	18
7 Jul	21	15
14 Jul	27	19
21 Jul	20	8

Figure 3/Table 3. Weekly prevalence of *Ceratomyxa shasta* and *Parvicapsula minibicornis* infection (Figure 3 only) in juvenile Chinook salmon captured in the Salmon to Trinity River (K2) reach on the Klamath River. One positive fish collected the week of 16 June is listed in table only. *C. shasta* POI for this reach is 56.6% (69+/122).



Weekly Date	Total Number of Samples (N)	Number Cs Positive
23 Jun	20	7
30 Jun	20	10
28 Jul	24	10

Figure 4/Table 4. Weekly prevalence of *Ceratomyxa shasta* and *Parvicapsula minibicornis* infection (Figure 4 only) in juvenile Chinook salmon captured in the Trinity River to Estuary (K1) reach on the Klamath River. *C. shasta* POI for this reach is 42.2% (27+/64).



Weekly Date	Total Number of Samples (N)	Number Cs Positive
30 Jun	20	7
14 Jul	20	12
21 Jul	20	17
28 Jul	20	12
4 Aug	20	8
11 Aug	20	8

Figure 5/Table 5. Weekly prevalence of *Ceratomyxa shasta* and *Parvicapsula minibicornis* infection (Figure 5 only) in juvenile Chinook salmon captured in the Estuary (K0) reach on the Klamath River. *C. shasta* POI for this reach is 53.3% (64+/120).