TRENDS IN PARASITIC COPEPOD INFECTION AMONG JUVENILE SALMONIDS IN WVP RESERVOIRS

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Reservoir rearing confers both positive (e.g., increased growth) and negative (e.g., passage mortality, increased predation risks/parasitic copepod infection) attributes to juvenile Chinook salmon. We assessed the infection level of reservoir-rearing juvenile salmonids by the ectoparasitic copepod *Salmincola californiensis* each month from 2012-2014. Infection levels were significantly greater for salmonids in reservoirs compared to streams **(Figure 1)**, and within reservoirs juvenile Chinook had a greater vulnerability to infection than kokanee, cutthroat and rainbow trout. Copepod attachment within the branchial cavity was more common in reservoir fish than stream fish, where attachment was more common on fin bases. Subyearling Chinook infection prevalence (proportion infected) increased each month, ranging from 75% to 99% by the fall among reservoir populations. Intensity also increased with time for both subyearlings and yearling Chinook salmon **(Figure 2)**. Consistent trends in infection levels were evident among reservoirs for the years we conducted assessments **(Figure 3)**. Infection prevalence and intensity was consistently greater for subyearlings in Fall Creek Reservoir and consistently lower in Lookout Point Reservoir. For the two years data were available for Fall Creek subyearlings, 16-20% of the fall migrants had > 20 copepods attached within the brachial cavity, a level that the literature suggests would cause mortality during saltwater transition. It appears copepods are able to 'reseed' the reservoir after winter drawdowns flush out most of the reservoir water and fish. A plausible hypothesis is that adult steelhead and Chinook transported above reservoirs act as vectors to 'reseed' the reservoirs with copepods and the difference in infection levels between reservoirs is related to the release location of adults. In Fall Creek, both steelhead and Chinook are released in or near the head of the reservoir, whereas in Lookout Point, Chinook adults are released >30 km upstream of the reservoir. Given the life-history of the copepod, copepodids are unlikely to survive drift into Lookout Point Reservoir but would in Fall Creek. The potential for prophylactic treatment of infected adults prior to transporting above dams is discussed.

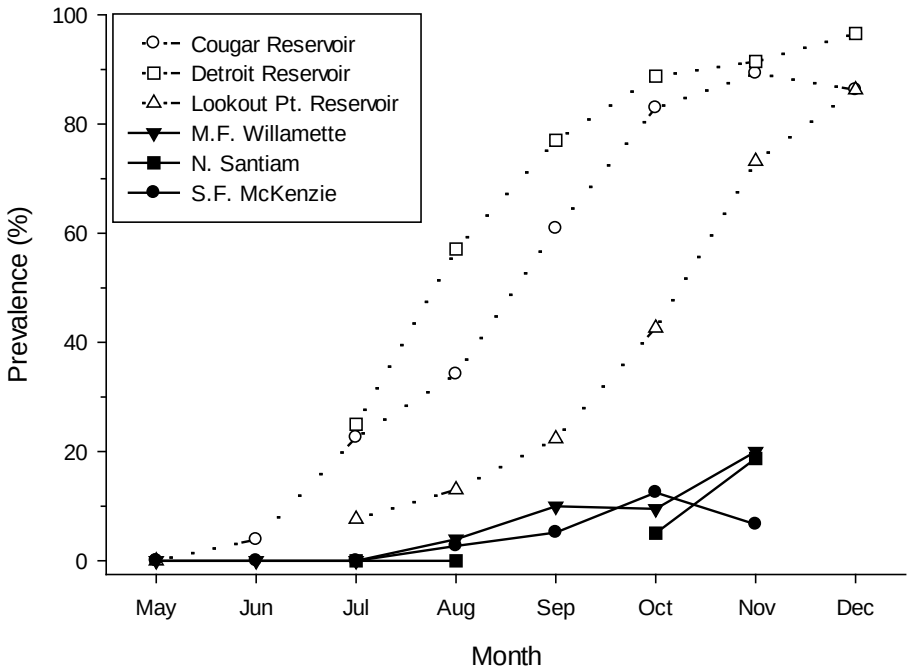

Figure 1. Copepod infection prevalence for age-0 Chinook Salmon in reservoirs and streams, 2012-2013. Open symbols are reservoirs and closed symbol are rivers upstream of reservoirs.

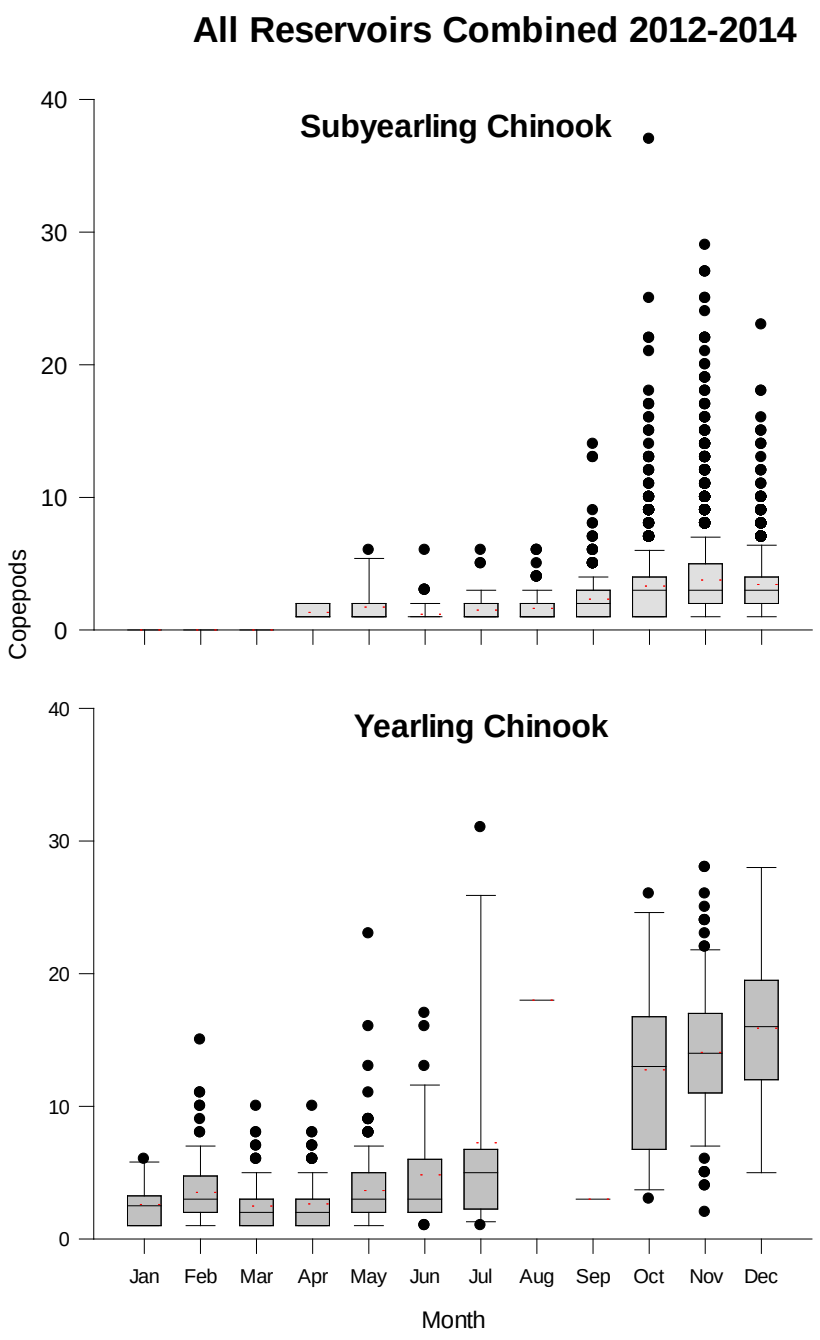

Figure 2. Number of copepods attached to age-0 Chinook Salmon rearing in Lookout Point, Detroit, Cougar, and Fall Creek reservoirs (combined) by month, 2012-2013. The horizontal line denotes the median; the box represents 25th and 75th percentiles; whiskers are 10th and 90th percentiles, and the solid circles are outliers.

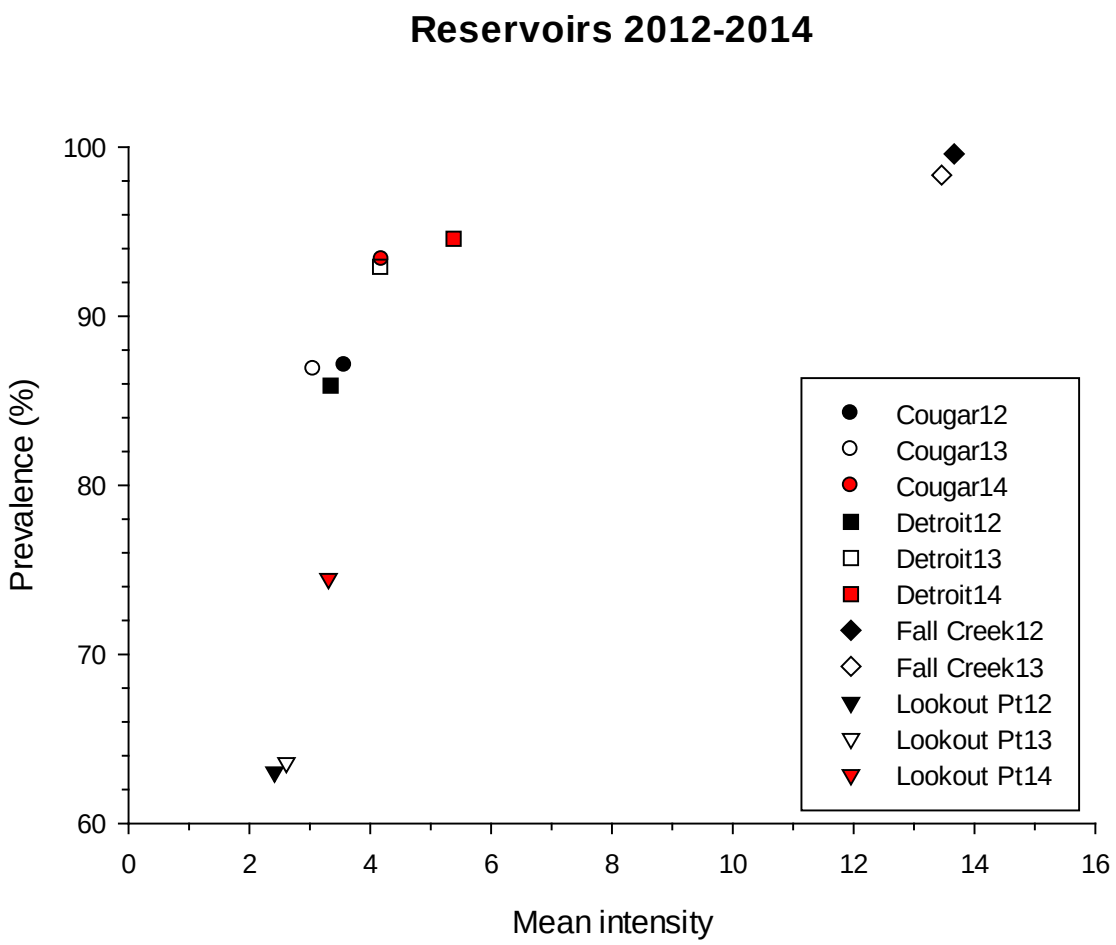

Figure 3. Copepod infection intensity and prevalence of age-0 Chinook Salmon rearing in four reservoirs during fall 2012-2014.