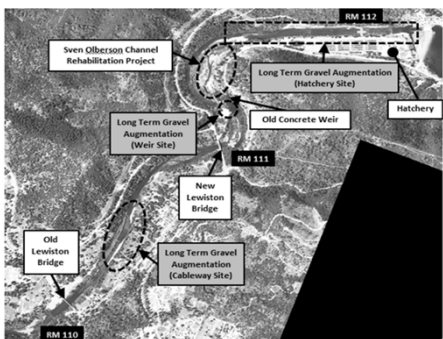


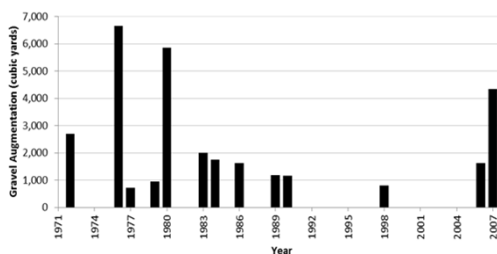
Update for the Proposed Hatchery Reach Restoration Project



Trinity Management Council Meeting June 18, 2014

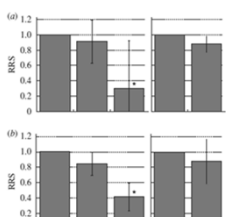
Long History of restoration in hatchery reach

- Gravel augmentation (1972-present)
- Spawning riffle development (1972-1977)
- Channel rehabilitation (2006-2007)
- Described as a long term gravel augmentation site in TRFE (1999)



Effects of hatchery rearing

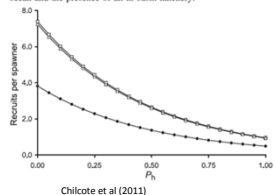
After TRFE (1999), a voluminous amount of literature was published on effects of hatchery rearing on salmonids.



Araki et al (2009)

Figure 2. Relative reproductive success (RRS) of each type of wild-born fish relative to that of fish having only wild parents (which have RRS=1.0, by definition). (a) Male F_{2s} , (b) female F_{2s} . Weighted geometric mean RRS among three years of samples is plotted for $W_{(C;W)}$ and $W_{(C;C)}$ relative to $W_{(W;W)}$ in the left panels, and for $W_{(C;C)}$ relative to $W_{(W;C)}$ in the right panels. Each point is the average over three years, and the error bar represents 1 s.d. An asterisk represents that RRS is significantly lower than 1.0 ($p < 0.05$).

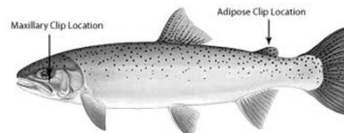
Fig. 3. Relationship between mean proportion of hatchery fish in the spawning population (P_h) and intrinsic productivity expressed as recruits per spawner at near-zero spawner levels as predicted from the productivity model with the lowest Bayesian Information Criterion (BIC) score (Model 12) for Chinook salmon (open square, \square), coho salmon (open triangle, Δ), and steelhead (filled circle, \bullet) under the assumption of no major dams in the pathway to the ocean and the presence of an in-basin hatchery.



Chilcote et al (2011)

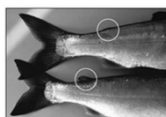
Latest Events

- Design work for hatchery project started Jan 2014, construction anticipated for the summer 2016.
- Renewed concerns of genetic effects of hatchery fish (ongoing since 2012) in March of 2014
- Call between program reps held April 2014
- Differences of opinion-majority of TRRP reps recommended a delay in design and construction
- Memo seeking guidance from three hatchery experts sent by TRRP in May 2014
- Hatchery expert review received weeks later



Hatchery Expert Review

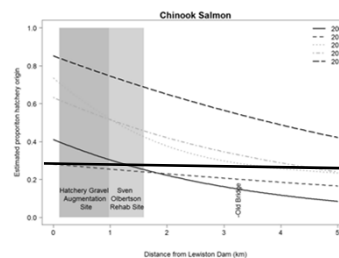
- Drs. Hankin and Kinziger: Recommend not pursuing restoration in this reach until steps are taken at the hatchery to use more natural origin broodstock, and reduce hatchery fish spawning in the river
- Dr. Garza: Recommended moving forward with restoration in this reach while continuing to research the issues.



Research suggests the chinook returning will benefit adjacent fish wild salmon.

Potential solutions

- Proportion of natural origin broodstock (pNOB) > proportion of hatchery fish spawning in the river (pHOS)
- Use more natural origin broodstock, investigate use of segregation weir near Old Lewiston Bridge
- Integrate or coordinate TRH and TRRP management



Conclusion

- TMC should be aware that the solution to this problem lies in TRH management, *not* TRRP gravel augmentation or channel rehabilitation
- Unknown is the amount of time required to tag 100% of chinook salmon, install a segregation weir, incorporate more natural origin broodstock, but could take several years.
- Assuming these changes to hatchery management occur in the future, what should be done in the interim? -gravel and wood recruitment will be lacking
- In the near future TRRP reps should attempt to reach consensus on the metric used to determine when restoration should proceed (e.g. pNOB>pHOS)

