Title:

Downstream migration success of Feather River Fish Hatchery steelhead smolts under different release strategies.

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Over the last decade, adult return of Central Valley Steelhead Trout (CVST) to the Feather River Fish Hatchery (FRFH), in California’s Central Valley, has gone through dramatic periods of decline. Poor adult returns could be attributed to several factors including yearling mortality during emigration, harvest, straying, or adoption of a resident life-history. Focusing on yearling mortality, we used acoustic telemetry to study patterns in apparent survival and migration behavior of FRFH yearling steelhead as they migrate to the Pacific Ocean. We also investigated the effect of release location, timing, and method (net pen acclimation versus direct river release) on survival through the lower Feather River.

Over this 5 year study (2009-2010; 2012-2014) estimated annual survival to the Sacramento-San Joaquin Delta (SSJD) ranged from 9% (9/100) to 45% (45/100). Far fewer fish were ever detected passing under the Golden Gate Bridge out to the Pacific Ocean (between 0% and 17%). However, reach survival by river kilometer was consistently lowest within the Feather River reach (uppermost reach) compared to the lower Sacramento River, SSJD or Bay reaches.

We did find some significant differences in relative survival among the release strategies we tested. We observed increased relative survival for steelhead released further downstream. We also found initial survival of steelhead was greater for fish released during the day and out of the net pen, however the differences in survival diminished as the fish moved downstream. By using acoustic telemetry, we were able to identify that poor survival of emigrating yearling steelhead may be contributing to poor adult returns. We were also able to quickly test the effect of different release strategies on yearling steelhead survival as well as identify reaches of relatively greater mortality that future management actions can address.