
From: Brian Ellrott - NOAA Federal <brian.ellrott@noaa.gov>
Sent: Monday, June 10, 2019 10:31 AM
To: Brown, Howard; Cathy Marcinkevage - NOAA Federal; Yip, Garwin; Maria Rea; Evan Sawyer - NOAA Affiliate
Subject: CV salmon smolt survival and flow literature review
Attachments: Iglesias et al. 2017 - Chinook salmon smolt mortality zones....pdf; Michel 2018 - Decoupling outmigration from marine survival indicates outsized influence of streamflow....pdf; Michel et al. 2015 - Chinook salmon outmigration survival.pdf; delRosario et al 2013.pdf

Hi all,

At Howard's request, I'm sending a few quotes related to this email subject. The papers reviewed are attached.

Iglesias et al. 2017

"Of the numerous mortality factors we included, spanning multiple spatial scales, flow correlated the strongest with out-migration success, providing further evidence of the importance of flow and water management practices to the out-migration mortality of hatchery origin Chinook salmon in the Central Valley."

"Flow has repeatedly been the most important factor affecting overall survival of Chinook salmon in the Central Valley (Kjelson and Brandes 1989, Zeug et al. 2014, Michel et al. 2015), likely as a result of concurrent temperature, velocity and turbidity conditions that influence the ability of smolts to evade predation while staying within their physiological tolerances."

Michel 2018

Indeed, the average annual smolt to adult ratio (SAR) estimates in this study were below 1% for all three populations [winter-run, fall-run, late fall-run]; for Upper Columbia River and Snake River Chinook salmon populations, the Columbia River Basin Fish and Wildlife Program suggests that a minimum of 2% SAR is required for population survival and 4% for population recovery (NPCC 2009). This study is an additional line of evidence suggesting that for California Central Valley Chinook salmon populations, the risks of outmigration may now be too high and these populations are likely no longer sustainable.

"However, the Central Valley may be an example of a system where the costs of outmigration are high enough that the anadromous life history strategy is no longer sustainable and is only persisting through the assistance of humans (such as through hatcheries or transporting outmigrants past regions of poor survival)."

Michel et al. 2015

"Overall survival of outmigrating late-fall-run Chinook salmon smolts in the Sacramento River is low in comparison with the Columbia and Fraser rivers, in spite of those rivers having substantially longer migration corridors."

del Rosario et al. 2013

"Our preliminary finding that winter-run migration through the Delta is substantially longer than previously assumed suggests that improving habitat conditions through this corridor should be a high priority for species management."

“Differences in timing of cumulative catch at Knights Landing and Chipps Island indicate that apparent residence time in the Delta ranges from 41 to 117 days...”

--

Brian Ellrott

Central Valley Salmonid Recovery Coordinator

NOAA Fisheries West Coast Region

U.S. Department of Commerce

Mobile: 916-955-7628

Office: 916-930-3612

brian.ellrott@noaa.gov