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**From:** Naseem Alston - NOAA Federal <naseem.alston@noaa.gov>  
**Sent:** Thursday, June 6, 2019 10:16 AM  
**To:** Brian Ellrott - NOAA Federal  
**Cc:** Stuart, Jeff; Joe Heublein; Evan Sawyer - NOAA Affiliate; Cathy Marcinkevage - NOAA Federal; Barbara Byrne - NOAA F... (Google Drive); Brown, Howard; Yip, Garwin  
**Subject:** Re: ROC LTO: Environmental Baseline update, Cyril's new paper

sounds great!  
go for it.

So, in the water management section? or...

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On Thu, Jun 6, 2019 at 10:07 AM Brian Ellrott - NOAA Federal <[brian.ellrott@noaa.gov](mailto:brian.ellrott@noaa.gov)> wrote:

Naseem,

Ok if I add a few sentences to the EB to incorporate this paper? I don't think it is already in there, but didn't check yet. The study provides further evidence that juvenile salmon survival through the river and Delta is low and a problem for species conservation.

<https://www.nrcresearchpress.com/doi/full/10.1139/cjfas-2018-0140#.XPIBUbzYqb6>

This study used a novel combination of short-term acoustic tagging data paired with long-term CWT recovery data to estimate marine survival rates for California Chinook salmon populations. The results indicated that marine survival for California Chinook salmon populations is similar in scale to outmigration survival. Given that these marine survival estimates are confounded with return river survival, net marine survival is likely higher than outmigration survival in most years. Two studies have found exceptionally low outmigration survival rates for California Central Valley Chinook salmon stocks compared with other large west coast rivers (Buchanan et al. 2013; Michel et al. 2015). Given these low outmigration survival rates, it would be mathematically impossible for these fished populations to be sustainable if marine survival was much lower than outmigration survival and hatchery propagation did not exist (Michel et al. 2015). Indeed, the average annual SAR estimates in this study were below 1% for all three populations; 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.

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**Brian Ellrott**  
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