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**From:** J. Stuart - NOAA Federal <j.stuart@noaa.gov>  
**Sent:** Thursday, April 18, 2019 4:08 PM  
**To:** Naseem Alston - NOAA Federal  
**Subject:** Re: Question on w-r survival data/modeling

This information comes from the work by Russ Perry and at the time of the 2009 opinion would have included his 2008 report to USFWS regarding the acoustic tag studies (using LFR CS) in 2006-07. Survival through the interior Delta (DCC and GS routes) ranged from 0.04 to 0.35, giving a mortality 65 % to 96%. Also Burau et al 2007 conducted studies during the same approximate period (2006-07) as did Vogel (2008) with similar survival/mortality rates for the Delta interior. This mortality is not directly attributable to entrainment at the exports (although some of the losses may be due to entrainment) but are most likely due to predation and increased predator exposure via longer transit times and distances to the west Delta through the Delta interior.

These are the references:

Burau, J., A. Blake, and R. Perry. 2007. Sacramento/San Joaquin River Delta regional salmon outmigration study plan: Developing understanding for management and restoration. 72 pages plus appendices. Available at: [http://www.science.calwater.ca.gov/pdf/workshops/workshop\\_outmigration\\_reg\\_study\\_plan\\_011608.pdf](http://www.science.calwater.ca.gov/pdf/workshops/workshop_outmigration_reg_study_plan_011608.pdf)

Perry, R.W. and J.R. Skalski. 2008. Migration and survival of juvenile Chinook salmon through the Sacramento-San Joaquin River delta during the winter of 2006-2007. Report prepared for the U.S. Fish and Wildlife Service. September 2008. 32 pages.

Vogel, D.A. 2008. Pilot study to evaluate acoustic-tagged juvenile Chinook salmon smolt migration in the Northern Sacramento-San Joaquin Delta 2006-2007. Report prepared for the California Department of Water Resources, Bay/Delta Office. Natural Resource Scientists, Inc. March. 43 pages.

On Thu, Apr 18, 2019 at 11:02 AM Naseem Alston - NOAA Federal <[naseem.alston@noaa.gov](mailto:naseem.alston@noaa.gov)> wrote:  
Hi Jeff,

Do you know the answer to Garwin's question (see attached SHORT paragraph)?  
and GC question on source?

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