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**From:** Brian Ellrott - NOAA Federal <brian.ellrott@noaa.gov>  
**Sent:** Wednesday, May 15, 2019 11:55 AM  
**To:** Evan Sawyer - NOAA Affiliate  
**Subject:** ROC LTO - winter-run I&S help

Can you help with Garwin's comments below? Similar to Garwin's second comment, Maria noted that there are updated ranges for the percent of years associated with each tier. I saw updated ranges wrt Shasta being >4.1 MAF (tier 1) in the Effects section, but not for the other tiers and thought you could find the numbers (mortality ranges and percent of years ranges) together quicker than I.

Specifically, under the PA, exposure to water temperatures that are lethal to winter-run Chinook salmon are expected to result in 6 to 9 [\[GMY1\]](#) percent mortality for 68 percent of years [\[GMY2\]](#) (Tier 1), 15 to 29 percent mortality for 17 percent of years (Tier 2), 34 to 63 percent mortality for 7 percent of years (Tier 3), and 81 to 88 percent mortality for 7 percent of years (Tier 4).

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[\[GMY1\]](#)6% is based on Anderson model, and 9% is based on Martin model. The range of mortalities within each model is higher.

[\[GMY2\]](#)Derek did a comparison of tiers based on historical Shasta storages and came up with different spreads, depending on the range of years used, but Tier 1 is lower % and Tiers 2 and 3 are higher, so higher likelihood of higher mortality.

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