

From: Julie L Yee [julie_yee@usgs.gov]

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To: Shawn Smallwood

Cc: gina.bartlett@gmail.com; jim.estep@comcast.net; Burger@Biology.Rutgers.Edu; sue@ibisenvironmental.com

Subject: Monitoring Period & Measuring Reduction

Shawn,

your points are well noted. I've been mulling over the 20 July conference call for the past week. I think I misinterpreted your earlier statement of needing a 75% reduction the next two years. In my work, I sometimes deal with trend analyses. So, a 0% reduction in year 1 followed by two annual reductions of 75% means that a population starting at 100 goes to 100 (no reduction first year), to 25 (75% reduction in 2nd year), to 6.25 (75% reduction in 3rd year). Cumulative reduction is 93.75%, which is huge, and the reason why I disagreed with your statement (also 3-yr average is 44, which exceeds 50% reduction from baseline). By the same token, a 50% annual reduction each year would result in a drop from 100 to 50 to 25 to 12.5, or 87.5% cumulative reduction and 3-yr average of 29. Would you agree that this is not the intended meaning of the settlement, and not the kind of annual reduction you meant? I now believe you meant that a sequence of 0, 75%, and 75% reductions are in reference to the original value. i.e. 100 (baseline) to 100 to 25 to 25, so average of three years is 50. If this is correct, then I apologize for the confusion, and won't dispute the numbers you gave.

I think these comments have brought up a more important issue. Our three year monitoring design has been put forth as a measurement of post-mitigation rates, and I would prefer not to deviate from calculating average annual mortality across multiple years for reasons of statistical precision that the SRC has already covered. However, I hesitate when I go back to considering the original question with the knowledge that mitigation actions are not yet complete. Now let me put the statistics aside, and ask this question pretending for a moment that sampling uncertainty is not an issue and we could precisely know every number of birds killed: What happens if management changes occur throughout the 3-year period, leading to incremental reductions that result in an actual APWRA wide cumulative 50% drop in mortality, but do not produce a 3-year average that is at 50%? I don't know what the answer should be; I don't think the SRC has adequately discussed it. Maybe it's something the Settlement parties should tell us. But if we don't have agreement here, then we don't stand much chance of agreeing about what the data will mean when it comes in, sampling errors, interannual variability, and all.

Julie