SMALLWOOD'S REPLIES TO THE PARTIES' RESPONSES TO QUERIES FROM THE SRC AND COMMENTS FROM THE CALIFORNIA OFFICE OF THE ATTORNEY GENERAL

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9 March 2007

After receiving the Parties' responses to queries from the SRC and comments from the AG's Office,[1] I prepared the following replies as a starting point in what I believe will be critical discussions over the future role of the SRC. These replies express my own opinions. The SRC is welcome to comment on them, or to use them to develop a collective SRC reply.

The format begins with a statement of the query as it was presented by the Parties, or in several cases as it might have been had the query been addressed.[2] I then break out the Parties' responses and my answers to their responses in sequence. (Note that in most cases I did not copy the Parties' response verbatim because the responses are often lengthy and confusing. Instead I usually summarized the main arguments I thought the Parties were trying to make.)

Responses to SRC Queries

Question 1

SRC Query: How will the parties respond to a 55% reduction estimate it if is qualified by a ±10% confidence interval?

Parties' Response: The parties will accept the point estimate of the percentage mortality reduction achieved.

Smallwood's Reply: While the Parties can decide to accept the point estimate of the percentage change in mortality, they need to understand it would be unscientific of the SRC to ~~do so~~. Estimates such as the estimate of the percentage reduction in mortality have to be interpreted in the context of the uncertainty surrounding the estimate. If the mortality reduction is estimated as 50% ±10%, then the SRC cannot be confident the 50% reduction goal was actually achieved because the actual reduction could have been 40% or 60% or any level of reduction in between these values. Only if the confidence interval completely exceeds 50%, e.g. 51-71%, can the SRC be confident the actual mortality reduction was at least 50%. This means the SRC, using an ~~80~~% confidence interval, will need to detect at least a 60% mortality reduction if it is to be confident the 50% target was reached.

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[1] Letter of California Office of Attorney General to Mr. Chris Bazar and Ms. Gina Bartlett, March 1, 2007.

[2] My notes from the February 5th meeting of the SRC inform me the Parties were to confer on questions I identified herein as numbers 5, 6 and 7. I recall opinions were provided during the meeting, but I also recall the Parties decided to confer further on each of these questions before answering formally.

Question 2

SRC Query: Will the relocation criteria differ among turbine types? If so, what will be these criteria?

Parties' Response A: The relocations of turbines will have to be made to existing towers that will fit those particular turbines, resulting in a like-for-like replacement, albeit at less risky locations. The Parties acknowledged Exhibit A provides no relocation criteria by turbine type, but state the SRC is free to make recommendations to "help reduce or avoid avian mortality."

Smallwood's Reply A: Contrary to the Parties' statement, the criteria in Exhibit A do not guarantee that turbines will be relocated to "less risky locations." Exhibit A provides relocation criteria regarding the slope conditions, which at first glance appear to be fairly detailed. Slope conditions where relocations will not be allowed are defined by distances from specified slope features and by percentage slopes adjacent to the site. Upon closer examination, however, the slope conditions are vague, and subject to a wide ranges of interpretations. For example, Exhibit A does not specify where on a slope its rate of elevation change should be measured. What constitutes a dip, notch, draw or canyon to one person will not necessarily be considered so by another. And unfortunately, Exhibit A gives the Companies sole discretion over determining whether relocation criteria are met.

Furthermore it is unclear from what source the slope conditions in Exhibit A are derived. These conditions do not appear to have been drawn from Smallwood and Thelander (2004) or any other source with which I am familiar.

Additionally, the way they are written, neither the settlement agreement nor Exhibit A disallows replacement of turbines at other sites (besides certain percentage slopes and slope features) that were considered relatively more dangerous by Smallwood and Thelander (2004). Such sites include the ends of rows in relatively low terrain, relatively isolated sites, or sites next to artificial rock piles, as examples. There is no requirement in section 5(c) of the settlement agreement or Exhibit A for the Companies to consult with the SRC, except for cases when the Companies decide that the slope criteria in Exhibit A are not met. But again, this decision is the Companies' alone.

Parties' Response B: "…it is the understanding of the parties that no new turbine towers will be erected."

Smallwood's Reply B: As this commitment does not appear anywhere in the settlement agreement or amended permits, this statement does not ensure that no new towers will be erected.

Question 3

SRC Query: Will the settling parties, subject to Exhibit G-1, be required to move rock piles and removing end of row turbines / derelict turbines, as required in Exhibit G-2?

Parties' Response: The question was not answered directly, but the parties instead used peripheral statements that together lead the reader to conclude the Parties will not remove rock piles or derelict towers/turbines as required in Exhibit G-2.

Smallwood's Reply: A clear answer would be appreciated. However, if my understanding of the response is correct, then the Parties need to understand the collective mitigation measures they have committed to using will be less likely to achieve a 50% reduction in mortality. At this time the only mitigation measure directed toward the 2,500 wind turbines in the SRC's monitoring program is a half-winter shutdown. The Companies are requesting credit toward shutdown of Tier 1 and Tier 2 turbines, and the blade painting experiment remains uncertain and no experimental design has been submitted to the SRC. It has already been shown that even a full winter shutdown, let alone a half-winter shutdown, standing alone cannot achieve a 50% mortality reduction.[3]

Question 4

SRC Query: Will the Buena Vista and Diablo Winds Repowering projects be measured as part of the 50% reduction?

Parties' Response: The 50% mortality reduction target applies APWRA-wide, and although each repowered project has separate monitoring requirements, the results will be incorporated into the 50% reduction requirement. The Parties also expect the NCCP will consider these issues as well.

Smallwood's Reply: If the 50% mortality reduction target is to apply APWRA-wide, as stated by the Parties, then there will be a problem, as pointed out during the SRC meeting of 5 February 2007. Not all the wind companies are participating with the Alameda County monitoring program, so the SRC will be unable to estimate the percentage mortality reduction APWRA-wide. The Parties must understand the SRC can only make a mortality estimate to the extent wind turbines were available for inclusion in the monitoring program.

The Parties' response is unclear on how the monitoring results from the repowered projects will be incorporated into the "APWRA-wide" estimated mortality reduction. Who will incorporate the project-specific estimates and how will this incorporation be done? It is unclear to me whether fatality monitoring has even begun at Buena Vista, two months after power generation has begun. Neither the SRC nor the monitoring team has any influence over the fatality monitoring at Buena Vista. Likewise, the SRC has no influence over the fatality and relative bird abundance monitoring at Diablo Winds. Consequently, it is premature to conclude that the Alameda County monitoring team/SRC can incorporate the results from these projects into the "APWRA-wide" mortality reduction estimate, as the results may not be comparable.

If the SRC concludes the results from these studies cannot be incorporated into its larger effort, then the baseline mortality estimate used in the settlement will need to be revised because

[3] Smallwood, K. S. and L. Spiegel. 2005a. Assessment To Support An Adaptive Management Plan For The APWRA. Unpublished CEC staff report, January 19. 19 pp.

Smallwood and Thelander's 2004 estimates included fatality data from the wind turbines that composed the Buena Vista and Diablo Winds projects prior to repowering. About 350 turbines composed these projects during the Smallwood and Thelander study, and 1,951 fatality searches were made among them (one fatality search is one search around one turbine). Overall, the raptor fatalities found per search were about 9% fewer among these turbines than among the remainder of the turbines searched by Smallwood and Thelander in the APWRA.[4] Because the original Buena Vista and Diablo Winds turbines were grouped with all the others when making mortality estimates, they contributed to a lower mortality estimate than would have been reached without them. If the SRC cannot incorporate the fatality data from the new (repowered) turbines composing the Buena Vista and Diablo Winds projects, then it will have to recalculate baseline mortality used in the settlement. This would be done by excluding the fatalities from the original turbines in these projects in order to accurately compare mortality estimates before and after implementation of avian protection measures. In other words, the APWRA-wide mortality comparison would not be accurate if the SRC compared the existing baseline estimate used in the settlement, which includes these original turbines, to a 2009 estimate which excludes these turbines.

If the SRC is able to use the post-repowering Buena Vista and Diablo Winds fatality data, it will still have to address the absence of the Northwind turbines from the current program, because Northwind did not participate in the settlement. Smallwood and Thelander made 268 fatality searches at those turbines during 2002-2003. These searches produced 35% more raptor fatalities per search than did the searches throughout the rest of the APWRA. Again, to make an accurate comparison, the baseline mortality used in the settlement will need to be recalculated without the Northwind turbines and the resulting comparison of mortality estimates will not be APWRA-wide.

Finally, if the SRC is able to use the post-repowering Buena Vista and Diablo Winds fatality data, the Parties need to understand these projects were not Alameda County avian protection measures – they were not mitigation, but rather new, stand-alone projects. These projects are not among the mortality reduction measures listed in the 2005 Alameda county conditional use permits, nor are they identified in the settlement agreement. Incorporating post-repowering fatality data from these projects could be misleading. If this step is taken, it might be more appropriate to estimate mortality with and without the post-repowering fatality data in order to more accurately assess the success of the settlement agreement, as well as to assess the effects of repowering.

Question 5

SRC Query: Will the SRC be restricted to the two mortality adjustment factors referenced in the settlement?

Parties' Response: No answer was provided.

Smallwood's Reply: Not applicable until the SRC receives an answer.

[4] I only considered the fatalities used in the estimation of mortality. These were the fatalities determined to have been caused within 90 days of discovery.

Question 6

SRC Query: What is the scientific value in shortening the previously required duration of the winter-time shutdown? Why did the Parties feel the SRC needed consistency in the inter-annual duration of the winter-time shutdown?

Parties' Response: No answer was provided.

Smallwood's Reply: Not applicable until the SRC receives an answer.

Question 7

SRC Query: Wind turbines used in the blade painting experiment are to be exempt from both the winter-time and permanent shutdowns, according to the settlement agreement. Therefore, if these turbines are also to be included in the monitoring sample of 2,500 turbines, their shutdown exemptions will add another source of variation that could complicate the subsequent hypothesis-testing by the monitoring team and SRC. If the turbines used in the blade painting experiment are to be included in the monitoring sample of 2,500 turbines, then it would be much less complicated to treat these turbines the same as the other turbines in all respects besides the painting treatment. Can the Companies transfer the shutdown exemptions applied to the turbines used in the blade painting experiment to other turbines the monitoring team and SRC will not be monitoring?

Parties' Response: No answer was provided.

Smallwood's Reply: Not applicable until the SRC receives an answer.

Responses to comments from the California Office of the Attorney General

Below are my replies to the Parties' responses to the questions and concerns raised by the California Office of the Attorney General.

Question 1

AG Query (as presented by the Parties): Does the settlement agreement misstate the baseline number based on the 2004 Smallwood/Thelander Report?

Parties' Response: No. The settlement identifies the baseline for all raptors as 1300, but it does not specify a baseline for the 4 target species. The Parties intend for the SRC to use the number 1130.2 as the baseline for the 4 target species. The 1300 number controls for all raptors but not for the 4 target species.

Smallwood's Reply: Neither the settlement nor the amended permits mention the number 1130.2 as a baseline mortality estimate. They use the number 1300 for all raptors. I am not an attorney,

but in my personal experience the letter of a legal agreement controls, not subsequent verbal interpretations of and representations regarding the intent of the agreement.

Also, as explained above, the baseline mortality estimate will need to be changed in order to avoid comparing mortality estimates from two different sets of turbines. Northwind is not participating in the monitoring program, but the current baseline mortality estimate includes fatalities and searches at those turbines. The same problem will apply to Buena Vista and Diablo Winds if the SRC is unable to incorporate future mortality estimates from those projects into the sample being monitored by the Alameda County monitoring team.

Question 2

AG Query (as presented by the Parties): What is the relationship between observed deaths and adjustments for searcher efficiency and scavenger removal?

Smallwood's Reply to Stated Query: The Parties responded to a question that was not asked by the AG's Office. The AG's Office presented an assessment of the consequences of relying on the mortality adjustment figure in the settlement, and requested the SRC consider these consequences in its next meeting.

Parties' Response A: The mortality adjustment factor of 3.15 used by Smallwood and Thelander (2004) was incorrect (i.e., likely too high) because the fatality search intervals were too long and perhaps due to searcher inefficiency. Another reason it was incorrect was because it was applied to all 5 years of data as if this aggregated set was one year of data. A higher scaling factor in these prior years was likely more appropriate at a time when the frequency and efficiency of the monitoring was reduced as compared to now.

Smallwood's Reply to Response A: The Parties claim Smallwood and Thelander (2004) used an incorrect mortality adjustment factor, yet at the same time they rely on the baseline estimate in that report, which is a product of this allegedly incorrect mortality adjustment factor. Thus, the Parties state that the baseline mortality estimate for the four target raptor species should be 1130.2 raptors/year (instead of the 1300 stated in the agreement). This 1130.2 figure was a product of the unadjusted annual mortality number for the four target raptor species, multiplied by the 3.15 adjustment factor the Parties now claim was incorrect. If Smallwood and Thelander's mortality adjustment of 3.15 is truly incorrect, then it is scientifically unacceptable to restrict the SRC to using the correspondingly incorrect baseline mortality value of 1130.2 (or 1300). It is also scientifically unacceptable to require the SRC to compare the baseline estimate adjusted by a factor of 3.15 to a later estimate to be adjusted by a different factor that the Parties acknowledge is likely to be far smaller (see further discussion below).

Another troubling aspect of this response is that the Parties are making conclusions that are supposed to be made by the scientists on the SRC. The Parties cited three reasons the Smallwood and Thelander mortality adjustment factor was purportedly incorrect. The Parties are not qualified to make these conclusions as is made clear by the scientifically uninformed arguments they use to conclude that the mortality adjustment was incorrect. For example, the Parties merely speculate that searcher inefficiency contributed to an incorrect adjustment, but

there is no basis provided for this speculation. Their argument that Smallwood and Thelander were incorrect to apply the adjustment to all five years at once instead of to one year at a time also does not make sense, because in fact the adjustments were applied to the annual estimates, not to an aggregated pool of fatalities across five years. The Parties similarly are wrong in claiming Smallwood and Thelander (2004) actually reported an average of 72 deaths of the four target raptor species per year. The correct figure is 359.2 raptor deaths per year, not 72. Arguing that the 3.15 adjustment factor likewise is incorrect due to long intervals between searches is fallacious because it was for those very intervals for which the 3.15 adjustment factor was developed.

Parties' Response B: Diablo Winds provided the best real-world example to the Parties at the time of the settlement. The scaling (mortality adjustment) factor for Diablo Winds was 1.64. A critic has suggested the scaling factor should be 1.98. In either event, the scaling factor for Diablo Winds was much smaller than the factor used in Smallwood and Thelander (2004).

Smallwood's Reply to Response B: This response is not only unclear, but it appears to prove the very point the AG's letter raised, and it appears to contemplate the future use of scientifically unsound comparisons. First, the response is unclear because it does not state what "real world example" was provided by Diablo Winds, in what study or report the purported mortality adjustment factors of 1.64 and 1.98 are reported, or how these factors were developed. Second, and more importantly, the stated fact that both mortality adjustment factors used for monitoring Diablo Winds were allegedly less than 2.5 goes to the heart of the concern raised by the AG's Office. The AG's Office was concerned that the SRC might ultimately recommend an adjustment factor that is lower than that used in the Smallwood and Thelander report. The SRC would then have to compare the future mortality estimate derived from this lower factor to the fixed baseline value that was adjusted by a factor of 3.15. The AG's Office pointed out that the more the future adjustment factor is reduced from the 3.15 factor used to develop the mortality estimate in the Smallwood and Thelander report (which is used as the baseline for the settlement), the greater will be the artificial credit for future mortality reduction (see example below). The Parties' reference to the substantially lower adjustment factors used for monitoring Diablo Winds confirms that such an artificial credit is indeed possible, and thus confirms the validity of the AG's concerns. Finally, the Parties' response appears to require the SRC to compare the future mortality estimate to a past estimate which the Parties apparently believe is inflated. This is scientifically unsound.

As an example, let's assume the same level of fatality search effort for the APRWA produces the same number of fatalities of the 4 target species over the next 3 years as compared to 1998-2003, or 359.2 fatalities per year. Adjusting this number of fatalities by a factor of 1.64 (as the Parties state was used by Diablo Winds) would yield an annual mortality estimate of 589 during our new monitoring period. This number would be compared to the settlement agreement's baseline estimate of 1130.2 fatalities per year (assuming the SRC can use this number instead of the stated number of 1300), which was derived from the adjustment factor of 3.15. Therefore, for the sole reason the mortality adjustment factors differ between the estimates, mortality would falsely appear to have been reduced 48% while the actual reduction was 0%.

Question 3

AG Query (as presented by the Parties): What is the meaning of the number "2.5" as used in the settlement agreement?

Smallwood's Reply to Stated Query: The Parties responded to a question that was not asked by the AG's Office. The AG's Office presented an assessment of the consequences of relying on the mortality adjustment figure in the settlement, and requested the SRC consider these consequences in its next meeting. (The AG's Office did not contend that the 2.5 figure established a "cap" on the mortality adjustment factors, nor did it assert that the settlement restricts the SRC's discretion in recommending a future mortality adjustment factor.)

Parties' Response A: The settlement agreement does not establish a cap on the scaling factor at 2.5. It is incorrect to claim the SRC lacks discretion in establishing the scaling factor.

Smallwood's Reply to Response A: Actually, the settlement states the SRC is free to recommend a mortality adjustment factor to the Parties, but the Parties then decide whether that adjustment will be acceptable and whether the baseline will need to be renegotiated if the adjustment factor exceeds 2.5. If the recommended mortality adjustment factor is less than or equal to 2.5, the Parties need not take any action under the settlement. However, the Parties did not respond at all to the AG's Office's key concern with the potential automatic reduction in mortality that would occur if the SRC recommends an adjustment factor of 2.5 or less. Nor did the Parties address the AG's point that the settlement agreement does not provide a mechanism for renegotiating the baseline if the recommended adjustment factor is equal to or less than 2.5.

Parties' Response B: If the SRC decides that the future mortality adjustment factor should be greater than 2.5, then the Parties, in consultation with the SRC, will renegotiate the baseline or the percentage mortality reduction requirement.

Smallwood's Reply to Response B: This point was not disputed in the AG's letter. Rather, the AG raised the question as to how the Parties would deal with the situation where the recommended adjustment factor is less than or equal to 2.5, which would thereby allow the wind companies to claim an automatic, "paper" reduction in mortality and also call into question the baseline in the settlement. Again, the Parties' response does not address this issue at all.

The Parties' response also indicates that the Parties intend to deviate from and/or influence the SRC's conclusions on how to compare mortality estimates before and after implementation of the avian protection measures. Setting parameters around the mortality adjustment factor(s) and the baseline mortality estimate to be used by the SRC will jeopardize the integrity of the scientific process as well as the independence of the SRC. If the scientists on the SRC are required to accept scientific conclusions reached as a result of future negotiations between the Parties, then the science will not be valid.

Parties' Response C: Some have erroneously suggested the settlement caps the scaling factors for the Smallwood and Thelander report at 2.5, resulting in an automatic reduction in raptor

mortality. The issue about scaling factors exceeding 2.5 applies to monitoring performed pursuant to the CUPs. It has no bearing on the calculations used in prior monitoring reports.

Smallwood's Reply to Response C: This response is extremely difficult to decipher and entirely misses the point raised in the AG's letter. I am unaware of anyone suggesting the mortality adjustment factor of 2.5 used in the settlement must be applied to the mortality estimate in the Smallwood and Thelander report, and certainly the AG's letter did not make this assertion. It is understood the mortality adjustment factor and mortality estimate in the Smallwood and Thelander report are not to be changed. However, it is also understood that a new, potentially lower adjustment factor may be applied to the future mortality estimate to be developed through monitoring under the amended conditional use permits. Use of a lower adjustment factor would render the future monitoring results scientifically incomparable to the Smallwood and Thelander settlement baseline. This is the issue raised by the AG's Office. The Parties' response indeed confirms that the Parties believe the future mortality adjustment factor is likely to be substantially lower than the 3.15 factor used to develop the baseline in the Smallwood and Thelander report, and in fact is likely to be significantly lower than the 2.5 factor referenced in the settlement. This indicates that the future mortality estimate is likely to be substantially less than the baseline used in the settlement, *even if* the raw, unadjusted mortality figures remain the same. As the example discussed above reveals, as the disparity in the adjustment factors increases, so will the artificial credit in mortality reduction increase when comparing the baseline mortality estimate to the future mortality estimate. Once again, the Parties' answer fails to indicate how this critical issue will be addressed.

Question 4

AG Query (as presented by the Parties): Is the 50% reduction requirement real?

Smallwood's Reply to the Stated Query: The AG's Office did not ask this question. The AG's Office presented the SRC with a quantitative assessment of the consequences of comparing the future mortality estimate with the baseline mortality estimate used in the settlement, when the future mortality estimate is very likely to rely on a different mortality adjustment factor than that used to develop the baseline mortality estimate.

Parties' Response: Yes. The Parties established the baseline and the mortality adjustment provisions to prevent any gaming of the system.

Smallwood's Reply: The Parties did not attempt to refute the quantitative assessment presented by the AG's Office. The Parties' have yet to respond seriously to the problem raised by the assessment.